

J. H. WILLIS

A Handbook to

PLANTS
IN VICTORIA

VOLUME I

Ferns, Conifers and Monocotyledons

SECOND EDITION

The need for a convenient handbook to plants in Victoria was felt for many years. The late Professor A. J. Ewart's *Flora of Victoria* (1931) has long been unprocureable, and increasing knowledge and the further spread of numerous alien species have outlived it.

Mr J. H. Willis, formerly Assistant Government Botanist in the Royal Botanic Gardens and National Herbarium, Melbourne, devoted more than twelve years of painstaking research to the preparation of the present *Handbook*—working in Australia, at the Kew Gardens Herbarium, and in the British Museum. The research was sponsored by the Maud Gibson Gardens Trust (see p. viii).

It is hoped that this comprehensive work, together with Volume II, will for many years continue to meet the needs of professional people—botanists, agriculturists and foresters—and of students, amateur botanists and all those who have or may develop an interest in the rich, diverse flora of the State.

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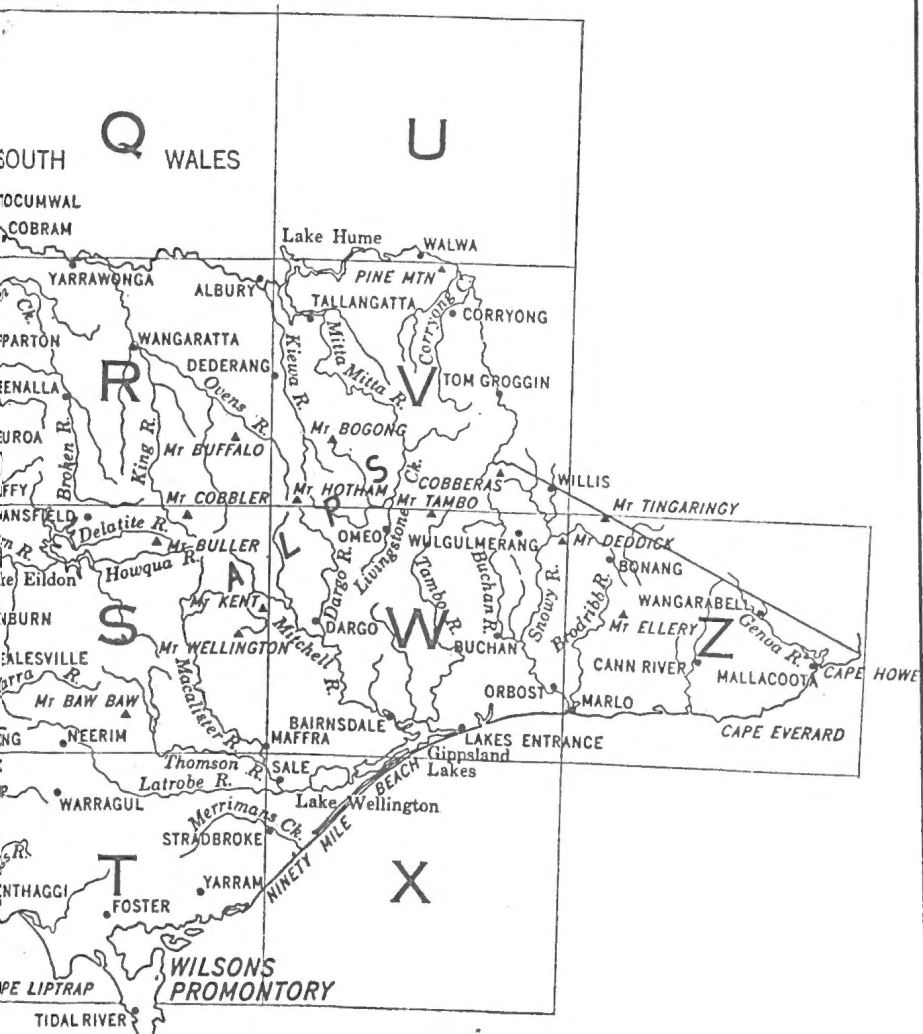
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A HANDBOOK TO PLANTS IN VICTORIA
VOLUME I

A HANDBOOK TO PLANTS IN VICTORIA

JAMES H. WILLIS
Royal Botanic Gardens, Melbourne

VOLUME I
Ferns, Conifers and Monocotyledons



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FOREWORD

AMONG the major botanical discoveries of the late 18th century, none was more important, or more exciting scientifically, than the realization that in the newly discovered and newly settled Continent of Australia there existed a flora that was unique in the plant world.

While the Australian coastline in part, notably Western Australia, had been known to explorers before this period, no systematic collections of Australian plants had been made prior to those of Joseph Banks and Daniel Solander in 1770 during the First Voyage to the South Seas of Captain James Cook in the *Endeavour* in the years 1768–71. Some plant specimens found their way into the universities and herbaria of Europe from the very first navigators, but these were insignificant compared with those that resulted from the later English botanical explorers. Material collected by Banks and Solander added substantially to the famous Banksian collection where, in the British Museum in London, it has become an important historical fragment of the early history of Australia.

These early collections were made, of necessity, close to the coastline. Every exploration party that later set out into the unknown areas of this new Continent made its own contribution to the increasing appreciation of the natural history of the new country.

The presence of Dr. (later Baron) Ferdinand Mueller in Victoria in 1852 commenced a new era in botanical collecting and study in that Colony. Mueller, an outstanding European botanist, immediately commenced an investigation of the botanical resources of Victoria, largely through the medium of a number of comprehensive journeys through the Colony, in the course of which he also made discoveries of great geographical importance.

The large masses of plant material which he collected on these occasions formed the basis for a number of taxonomic papers and publications by himself, and also paved the way for the production of the first comprehensive flora of Australia, *Flora Australiensis*, by George Bentham of London, assisted by Ferdinand Mueller. This detailed work in seven volumes was published between the years 1863 and 1878, and remains to the present time the only comprehensive account of the flora of the Continent as a whole. Today there is an urgent need for a modern flora of the whole of Australia based on critical and original revisions and on material discovered since Mueller's day, which will be more than a compilation of something that has already been published.

Until comparatively recent times all the professional taxonomic workers in botany in Australia were centred at one or other of the State herbaria. It was, therefore, natural that each State should produce a regional flora. These suffer from the artificial nature of State boundaries, and do not meet the over-all position of the Continent, although it is realized that they fulfil a much-felt need in individual cases.

The need for a flora of Victoria had been felt for nearly half a century since the publication of Mueller's *Key to the System of Victorian Plants* (1886-88); his *Eucalyptographia* in 10 decades (1879-84); his *Iconography* of the Acacias in 13 decades (1887-88); his *Iconography of Salsolaceous Plants* in 9 decades (1889-91); and his *Fragmenta Phytographiae Australiae* in 12 volumes (1858-82). This need prompted the Government of Victoria in 1927 to commission the then Professor of Botany at the University of Melbourne, Professor A. J. Ewart, to undertake the preparation of a "Flora of Victoria". In association with a number of colleagues, Ewart completed this task in three years, and in 1930, the *Flora of Victoria* was printed by the Government Printer, and issued to the public in April 1931. However, with increasing knowledge of the subject and with the further spread of numerous alien species, this work is now outdated. No further edition was published, and of latter years it has assumed the rôle of a collector's piece.

However, critical work in taxonomy has continued, the results of such work being published in various journals such as the *Victorian Naturalist*, *Contributions from the New South Wales National Herbarium*, and more recently in *Muelleria*—a publication of the National Herbarium of Victoria. At the same time, there was also a strong feeling that an up-to-date authentic flora of Victoria was a pressing necessity.

As a memorial to her father, William Gibson, founder of Foy and Gibson Ltd., Miss Maud Gibson in 1945 donated the sum of £20,000 for the setting up of a Trust, to be known as The M. M. Gibson Gardens Trust, the income from which was to assist the work of the Royal Botanic Gardens and the National Herbarium of Victoria.

In 1947, with the approval of the then Director, Mr. James H. Willis, a senior Botanist in the Herbarium, was commissioned to undertake the compilation of this Flora, the Miss M. M. Gibson Trust assisting in this work by providing the salaries of temporary herbarium assistants during Mr. Willis' preoccupation with the Flora.

As a result of twelve years of painstaking research in this country, at the Herbarium in Kew Gardens, London, and the British Museum the first section of this task has reached completion, and Volume I of a *Handbook to Plants in Victoria* now appears. This volume contains reference material to the Ferns, Conifers and Monocotyledons of Victoria, native and introduced. It is confidently expected that Volume II, the manuscript of which is partly completed, will be published in the near future. This volume will contain the Dicotyledonous families, genera and species.*

It is anticipated that this comprehensive work in two volumes will meet for many years the requirements of professional people requiring a knowledge of taxonomic botany—botanists, agriculturists and foresters—students, amateur botanists and all those who have an interest in the flora of the State of Victoria.

The publishing of this monumental work has been the joint financial responsibility of the Miss M. M. Gibson Trust and the Government of Victoria, and to both of these bodies the scientists and the laymen are deeply indebted.

R. T. M. PEScott

Director, Royal Botanic Gardens and
National Herbarium, Melbourne

* Volume II published 1973

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INTRODUCTION

AIM, SCOPE AND USE OF HANDBOOK

THE purpose of the present work is to provide a means for readily identifying, in field or herbarium, the various families, genera and species of vascular plants—both indigenous and naturalized—that occur spontaneously within the State of Victoria. F. Mueller's *Key to the System of Victorian Plants* (1886–88), an admirable handbook in its day, gave the inspiration and incentive to produce a similar book along modern lines, embracing also the established weeds of alien origin which are now as numerous, in many settled areas, as the surviving native species. Some difficulty arose in deciding whether certain aliens were sufficiently well established to be called naturalized. In general, any species noted but once many years ago, presumably of casual or sporadic introduction and not now spontaneous anywhere, has not been included in the key; while those which are known by two or more modern occurrences, from different localities, are admitted. Except for the ferns, clubmosses and a few allied groups, all cryptogams are deliberately excluded; large numbers of them are still very imperfectly known, and their inclusion would have delayed the publication of this handbook by many years.

It had been hoped, originally, to accommodate the complete key in one volume of convenient size, with single treatment of all families and a single index to the whole. This proved impracticable, and the work has been spread over two volumes, each self-contained, with separate keys to families and separate indices. The present Volume I includes ferns and their allies, conifers and monocotyledons (a total of 285 genera and 943 species). Volume II will contain all the dicotyledons and will be more than twice the size.

While this handbook is in key-form throughout, it does provide much more information about individual species than is usually found in botanical works bearing the title of *Key*. However, it must not be regarded as equivalent to a full-length, comprehensive flora with detailed descriptions—such a project for an area as large as Victoria, having a wide diversity of climates and soil-types, would need to be much more bulky and would be almost prohibitively expensive to the student.

A key is not a "door", and has severe limitations; it will only work satisfactorily for the material used in its construction—in this instance the Victorian populations of species, genera and families. Weaknesses are more apparent at the level of higher categories, e.g. plant families having but one or two representatives in Victoria (*Thelypteridaceæ*, *Podocarpaceæ*, *Burmanniaceæ*, *Moraceæ*, *Menispermaceæ*, *Bignoniaceæ*, *Gesneriaceæ*, etc.); it may be impossible to use the present key for determining such taxa on the basis of their component genera and species in other parts of Australia, much less in distant countries. Moreover, the only form of a species present in Victoria may

not be typical of the races predominating in one or other neighbouring States. No attempt has been made to provide key-accommodation for natural hybrids (as among members of *Acacia*, *Eucalyptus* and *Orchidaceæ*), but proven or strongly suspected instances of hybridism are discussed under the parent species.

One cannot too firmly emphasize that any key, aiming at convenience and speed of specific identification, must rely on *artificial characters* (i.e. shape, size, colour and surface features of various organs). Thus, the order in which species will fall out, in the scheme of dichotomy adopted, often bears little relationship to their true phylogenetic affinities. If a certain taxon be highly variable in its gross morphology, more is gained by keying it out in two or more places than by using a mass of explanatory detail to encompass all the variations known to occur—simplicity is the essence of every good key.

The initial "Artificial Key to Families" is an amplified adaptation of the similar but shorter key by Clapham, Tutin and Warburg in *Flora of the British Isles*, pp. xxxi-li (1952). For the succeeding keys to genera and species, important contrasting adjectives are picked out in *Italic type* for emphasis. The first few dichotomies, at least, have been based as far as possible upon such macroscopic features as are easily observable in the field. A key that requires, at the outset, the careful sectioning of a minute ovary, or that begins with the orientation of cotyledons within a seed, is both inconvenient and annoying—no matter how important such structures may be from a strictly taxonomic point of view. Field characters (habit, bark, texture, colour, odour, taste, duration, commensalism, etc.) are so often unknown or lost in dried and pressed material, but they have been used in this handbook, wherever practicable, to distinguish cognate species.

Such vague terms as "large" or "small", which are purely relative, have been avoided and replaced by definite dimensional limits e.g. "*up to 5 mm. long*" for one species, as against "*10-15 mm. long*" for another—there being no overlap in size. This principle has been carefully observed in the present key. Measurements of leaves and other organs concern the usual average plant, *not* runts or giant forms induced, respectively, by abnormally poor or exceptionally favourable conditions for growth.

In order to facilitate identification, and to render it certain beyond reasonable doubt, *several* characteristics are set out under each pair of contrasting statements. Then, if the key seem rather indecisive as to one feature (the shape of petals, for instance), another feature (e.g. colour of anthers or hairiness of ovary) may serve to clinch determination. It follows that, the more species there are in a genus, the greater will be the number of characters necessary to distinguish them. For genera having only a single species in Victoria, there will obviously be no key characters to that species *per se*, but the lack has been offset by a brief diagnosis for all such monotypes.

SYSTEMATIC ARRANGEMENT OF FAMILIES AND TRIBES

Families are set out according to the system of Engler and Prantl in *Die Natürlichen Pflanzenfamilien*, 1888–1902 (revised edition 1926–). This sequence, which was adopted by A. J. Ewart in *Flora of Victoria* (1931) and by J. M.

Black in *Flora of South Australia*, edition 2 (1943–57), is now most generally used throughout the world. A few minor modifications have been introduced as a result of more recent monographical work in certain groups, e.g. the segregation of additional families or tribes, and transfer of the tribe *Allieæ* from the family *Liliaceæ* to *Amaryllidaceæ*. Tribal divisions are provided, in the key, only for those larger plant families having about 50 or more representative species in Victoria—for instance, the *Gramineæ*, *Cyperaceæ* and *Liliaceæ*. Each family, genus and species is prefixed by a serial number, so that the number of species per genus or family may be readily assessed and the interpolation of additional groups facilitated.

TABULATION OF DETAILS FOR SPECIES

The dichotomies of the key appear in “8-point”, with the name of each species in bold black type. All other information concerning a species (beneath its name) has been printed smaller so as to be more readily distinguished from the key itself. In very few instances, where a species remains undescribed, it it appears in the key as, for example, “283. *Deyeuxia* sp.”.

Authority and place of original publication are cited after every specific name, also for the subspecies and varieties recognized as occurring in Victoria. The titles of publications (in full or abridged), together with volume numbers, are printed in *Italic* type followed by a colon; then come the page and/or plate number, and lastly the year of publication (between round brackets)—a customary and convenient method for quoting scientific works. This is the first time that such full citations have been given in any comprehensive work on the Victorian flora. No effort has been spared to achieve accuracy in these references to basic literature. In all but a very few instances (when rare works were inaccessible and relevant entries in the *Index Kewensis* had to be taken for granted) original descriptions have been consulted; thus, volume-number, page, figures (if any) and date were checked afresh—and it was astonishing to find how many errors of citation had been perpetuated in major texts on the plant life of Australia.

Basionyms (with authorities and publication details) are cited in synonymy, as well as those names that were applied to the same species in A. J. Ewart's *Flora of Victoria* (1931)—wherever the latter have required correction in the light of more recent researches. Any appropriate comments therewith appear in abbreviated Latin, for example (under Species No. 9) “*Gleichenia circinnata* sens. Ewart . . . (1931), atque auctt. plur., *non* Swartz (1801)” means that this name, *in the sense* with which Ewart and several authors have applied it, does *not* refer to the species as described originally by Swartz under the same binomial. No attempt has been made to provide full synonymies, which would overburden and defeat the purpose of the key.

Following the species-name (and citations) is a selection of references to published illustrations, for use by any inquirer wishing to confirm his identification pictorially. The accepted vernacular name is given, together with alternative common names in use elsewhere (the latter in parentheses). As a general principle, accepted vernaculars are those prescribed in C.S.I.R.O. Bulletin No. 272 (“Standardized Plant Names”, 1953), supplemented by many

in Ewart's *Flora of Victoria* (1931) and others recommended by the Plant Names Subcommittee of the Field Naturalists Club of Victoria after five years of intensive effort (1943-48). For some introduced plants a valuable guide has been the second edition of *Standardized Plant Names* (published by the American Joint Committee on Horticultural Nomenclature, 1942). Distributional data include the range of the species within and beyond Victoria, brief notes on its frequency and indications of ecology (habitat preferences, formations in which usually to be found, etc.) For all taxa rare and/or localized in Victoria, every known locality is quoted; but, for widespread and frequent species, only representative localities are given (listed from west to east).

The choice and arrangement of references to illustrations call for further comment. Wherever the writer was unable to trace a single delineation of any particular species, the word "Nil" follows the heading "*Illust.*". Where very few illustrations exist, they are all indicated (good or otherwise); but a selection has been necessary for those species portrayed in many works at various times, e.g. *Typha angustifolia* (Bulrush) and introduced *Bromus mollis* (Soft Brome). The colour plates appearing since 1787 in *Curtis's Botanical Magazine* (London) are given place-priority over all other illustrations. Then follow important Australian works of reference, beginning with the more recent and descending chronologically to older 19th-century figures; New Zealand and other extra-Australian references (if satisfactory) come last, in similar order. Whenever known, the photographer's or delineator's surname is mentioned (unabbreviated), but without initials—for example, "Archer & Fitch in Hooker f., *Flor. Tasm.* 2; t. 126, col. (1858)" would refer to a coloured plate of an orchid delineated jointly by William Archer and Walter Fitch for J. D. Hooker's elaborate *Flora Tasmaniae*. Except for species with few portraits, most references to indistinctive figures of poor quality, to old and very rare works, or to those not readily available in Australia, have been omitted. On the other hand, illustrations in important monographs to families or genera, during the past century, are always quoted high in the list. Drawings by Mary Pomeroy in Professor H. L. Mason's *Flora of the Marshes of California* (1957) are of exceptional quality and are cited wherever the same species affect Victoria.

A prefixing query [?] serves to indicate uncertainty as to the correctness of a name, date, record of occurrence, etc.

TERMINOLOGY AND UNITS OF MEASUREMENT

There is no glossary of scientific terms appended to the key, but those used throughout (e.g. glabrous, glaucous, obovate, filiform, etc.) should be well known to anyone with an elementary knowledge of botany. Long or unfamiliar expressions have been avoided and their meaning rendered by English words of common usage: for example, "funnel-shaped" instead of *infundibuliform*, and "thin-coated" instead of *leptodermatous*. The word "cell" has been reserved strictly for the unit of protoplasmic structure; it is not used for the cavity of an anther or compartment in an ovary where "loculus" is the correct word.

As a concession to those not very conversant with the metric system, a compromise has been struck in the use of dimensional units. As a general rule, larger-sized organs are described in feet or inches; but, for measurements of less than one inch, centimetres and millimetres are employed. Thus, a long narrow leaf may be given as up to 18 inches long, but 1.5-3 mm. wide. Fractions are consistently avoided.

ABBREVIATIONS

For the economy of space, certain symbols and abbreviations have been adopted, as follows:

General

* (as prefixing sign)—denotes a naturalized alien group (family, genus or species).

±—more or less, approximately.

>, <—greater than, less than.

& (connecting two words or numbers)—used instead of “and” where there are joint authors, or where localities, etc. are closely connected.

illust. = illustrations; *vern.* = vernacular or common name; *distr.* = distribution; *diagn.* = diagnosis.

t. = plate; *fig.* = figure; *n.* = number; *col.* = in colour; *l.c.* = in the place cited; *opp.* = opposite to.

Geographical

R. = River; *Ck* = Creek; *Mt.*, *Mtns.* = Mount, Mountains; *Id*, *Is* = Island, Islands; *Prom.* = Promontory; *Penins.* = Peninsula.

Vic. = Victoria; *Tas.* = Tasmania; *S.A.* = South Australia; *W.A.* = Western Australia; *N.S.W.* = New South Wales; *Qd* = Queensland; *Cent. Aust.* = Central Australia; *N. Terr.* = Northern Territory; *A.C.T.* = Federal Capital Territory; *N.G.* = New Guinea; *N.Z.* = New Zealand; *N.Cal.* = New Caledonia; *S.Amer.* = South America; *N.Amer.* = North America; *U.S.A.* = United States of America; *S. Afr.* = South Africa; *N. Afr.* = North Africa.

Dimensional

alt. = in altitude; *diam.* = in diameter.

ft. = feet; *1"* = 1 inch; *cm.* = centimetre; *mm.* = millimetre.

Citatory

The shortening of author's names follows current procedure in botanical works—e.g. *L.* for Carl Linnæus, *R. Br.* for Robert Brown, *Benth.* for G. Benthams, *Hook. f.* for J. D. Hooker (son of W. J. Hooker), *F. Muell.* (not “F.v.M.”) for Ferdinand von Mueller. The surnames of most modern botanists are written in full, with initials, to avoid confusion with earlier and better known authorities.

In abbreviating the titles of periodical works, a standard pattern has been adopted, viz. the forms used in the third edition of *World List of Scientific Periodicals published in the Years 1900-1950*, edited by W. A. Smith and F. L.

Kent, 1952. Older works that ceased before 1900 are abbreviated in conformity with this *World List*. Minor deviations are made in a few instances; for example, the "Melbourne" has been deleted from *Vict. Nat.*, *Melb.* and *Wild Life, Melb.* as being superfluous; extra-Australian journals, that also bear the title *Victorian Naturalist* or *Wild Life*, are not involved in the description or illustration of our State's flora.

SHORT GLOSSARY OF LATIN EXPRESSIONS

<i>al. (alii)</i> = others	<i>nec</i> = not, nor
<i>atque</i> = and also	<i>nom. illeg. (nomen illegitimum)</i> = illegitimate name
<i>Aust. (Australiæ)</i> = of Australia	<i>nomen nudum</i> = name only (without accompanying description)
<i>auctt. (auctorum)</i> = of authors	<i>non</i> = not
<i>certe</i> = undoubtedly	<i>plur. (plures)</i> = several
<i>cum icon. (icone)</i> = together with illustration	<i>pro parte</i> in part (for part)
<i>et</i> = and	<i>sens. (sensu)</i> = in the sense of
<i>etymol. orig. (etymologicæ originalis)</i> = original form of spelling	<i>strict. (stricte)</i> = strictly, precisely
<i>in err. (errore)</i> = in error	<i>teste</i> = by witness of (according to)
<i>inter</i> = between	<i>ut</i> = as (<i>ut sp.</i> = as a species)

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The writer desires to place on record his indebtedness for much assistance in this onerous project, and to thank several kindly, devoted team-workers and institutions. In particular he is most grateful to the following:

The Maud Gibson Trust (for Royal Botanic Gardens, Melbourne) which sponsored and financed the work, enabling the writer to make field investigations throughout Victoria as well as the study of critical specimens in British repositories, providing for the services of other workers at Melbourne Herbarium so that he could be free to undertake the essential literary work, and, above all, exercising extreme patience during the twelve years taken for its completion.

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Messrs. A. B. Court and T. B. Muir (both staff members at Melbourne Herbarium) who spent months carefully checking the spelling of names and accuracy of citations for all species, by reference to original descriptions. This involved many visits to Melbourne Public Library and extensive correspondence with libraries overseas. Thanks to their magnificent work, the nomenclature of Victorian vascular plants is now as reliable, and free from error, as it is possible to achieve.

Mr. Court also assisted by re-checking a number of corrected proofs, and he is entirely responsible for the key to *Acacia* species—his particular speciality—which will appear in Volume II.

Miss Helen Aston (Melbourne Herbarium) who listed all the Victorian localities represented by specimens in the National Herbarium for most species appearing in the present key—an exacting task.

Miss Mervyn Davis (formerly of Melbourne Herbarium) who combed through much Australian periodical literature for any satisfactory illustrations of Victorian plants.

Miss Mary Todd who prepared the index.

Last, but not least, must be mentioned the writer's wife, Mavis Eileen Willis (a plant lover), without whose unselfishness and cheerful encouragement he could never have completed his task; for innumerable nights over many years she remained alone, patiently controlling the home and family, while he worked with books and specimens at the Herbarium—such gallant devotion is beyond all praise.

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30th April 1962

PROCEDURE IN USING KEYS

Keys in this *Handbook* are at three levels, viz.: to plant families, to genera within each family, to species of each genus. The process of identification is best explained by working through an actual example. Suppose that we wish to find out the name of a spider-orchid with large green "combs" edging its lip. If neither the genus *nor* family is known it would be necessary to begin at the "KEY TO FAMILIES" (opposite, on page 1). Under section 1 of this key are two alternatives: free-floating aquatic plants, land plants (or at least rooting in mud). Obviously, our specimen belongs to the latter category, which leads one (*by means of a figure at the right-hand margin*) to section 3 of the key—half-way down page. Here are two further alternatives: leaves exposed to the air, leaves permanently submerged. The former statement describes our plant, so the marginal figure leads to section 8 on the next page, where *three* alternatives appear; the first one (plants with true flowers) clearly applies, and we are now referred to section 30 (on p. 5). As the specimen has green pigment, the first of two possibilities takes us on to section 32. Since it is neither a tall palm *nor* a large tussock with leaves 1-5 ft. long, it can only fit the third alternative leading to section 33. From here we pass in succession to sections 34 (perianth of 2 *distinct whorls*), 35 (petals at length *free*), 39 (ovary *inferior*) and 40 (perianth *zygomorphic* or "irregular"). Under section 40, the first alternative (stamen 1, *fused* with style to form a column) brings us straight to the required family, viz. *ORCHIDACEÆ*, and there is a bracketed reference to p. 344 whereon the key to orchid genera begins.

The specimen (terrestrial, with non-leathery leaves) fits the second alternative on p. 344 and leads us to section 2; so we pass in turn to sections 7, 9, 10, 11, 14, 15, 16, 18, 19 and 20, by successively eliminating those alternative statements that do *not* fit the characters of the specimen in hand. At section 20 we are confronted by a final choice as to genus: leaf glabrous etc. *versus* leaf hairy etc. The latter alternative applies, and the genus is obviously *Caladenia* (No. 275 on p. 384).

Keys to species differ from those to genera or families in being more widely spaced, because illustrative details, distributional data and sundry notes under each specific name (with its citation) are all inserted in smaller type *between* some sections of the key. Here, from p. 384, we pass at once to the second alternative (introduced *by a long dash* on p. 385)—"Lateral petals *not* longer than sepals." This brings one to the next line where the two major divisions of *Caladenia* are defined: *Eucaladenia* (with short floral segments) and *Calonema* (with long spidery segments). Our orchid certainly belongs in the latter group, so we are referred to section 3. The first alternative fits our plant perfectly—labellum much wider than long, with conspicuous *green comb-like* sides and recurved maroon tip. The name we have been searching is *Caladenia dilatata*.

ARTIFICIAL KEY TO FAMILIES*

(PTERIDOPHYTA, GYMNOSPERMÆ and MONOCOTYLEDONEÆ)

1. Aquatic plants, *floating free* on or near the water surface 2
Land or water plants; if aquatic, then rooting in mud below the water 3
2. Flowerless plant ("water fern") with short brittle branches *in one plane* and numerous small *imbricate* leaves (to 6 mm. long), forming reddish carpets on still water (lakes, pools, lagoons, etc.); sporocarps globular, sessile, as large as leaves, situated near attachment of roots:

AZOLLACEÆ (p. 48)

Flowering plant ("duckweed") consisting of a discoid thallus (1-12 mm. wide), with or without roots from the under-surface, budding vegetatively to form extensive *green scums* on still water; flowers in sockets on thallus, microscopic, evanescent and rarely produced:

LEMNACEÆ (p. 268)

Flowering plant ("water hyacinth"); leaves conspicuous, rotund, shining, inflated and *bulb-like* at the base; flowers large, mauve (*Eichhornia*):

*PONTEDERIACEÆ (p. 282)

3. Land plants, or semi-aquatics with at least the terminal leaves or fronds *exposed* to the air (but foliage sometimes lying on the surface of water) 8

Aquatics with all leaves *permanently submerged* and often rapidly shrivelling upon exposure to air, but the inflorescence may project above water [leaves *never* deeply forked or dissected as in aquatic members of the *Dicotyledoneæ*, q.v. in Vol. II] 4

4. Flowers axillary and solitary, *or* in few-flowered clusters (sometimes insignificant at bases of leaves) 6

Flowers *in spikes*, usually numerous (including grass-like marine plants) 5

5. Spikes *simple*, *rising above surface* of fresh water; perianth-segments 4; fruits <5 mm. long; leaves on buoyant elongated stems:

POTAMOGETONACEÆ (p. 63)

Spikes *compound*, *submerged* in the sea; perianth *absent*; fruits acuminate, \pm 2 cm. long; leaves in tufts, ribbon-like (to 15 mm. wide):

POSIDONIACEÆ (p. 67)

Spikes flattened, *simple*, enclosed in sheathing leaf-base and *submerged in salt water*; perianth absent; fruits <5 mm.; leaves grass-like, arising from a rhizomic rooting stem:

ZOSTERACEÆ (p. 67)

6. Leaves *capillary*; flowers *bisexual*, without perianth, borne at the end of a long *spirally coiled peduncle*: RUPPIACEÆ (p. 68)

* Adapted from arrangement by A. R. Clapham, T. G. Tutin and E. F. Warburg in *Flora of the British Isles*, Cambridge (1957 ed.).

Leaves *not* capillary and often broad, or, if filiform, then the flowers unisexual and not surmounting a coiled peduncle 7

7. Leaves *entire*, either filiform or boldly truncate and distichous (when marine); female flowers with 2 or 3 separate 1-seeded carpels:

ZANNICHELLIACEÆ (p. 68)

Leaves *denticulate* throughout, *narrow-linear*, grass-like and flexuose; flowers minute, solitary, axillary, subsessile, unisexual, submerged in fresh water; carpel and ovule solitary: NAJADACEÆ (p. 70)

Leaves *entire* or toothed (when in whorls, then *denticulate* throughout), broadly linear, lanceolate or oblong (never truncate); flower solitary, sessile when marine but long-stalked in fresh water, the females with an entire 1-locular ovary and numerous ovules:

HYDROCHARITACEÆ (p. 75)

8. Plants developing true flowers and multiplying by seeds that are borne in ovaries until mature [ANGIOSPERMÆ] 30

Woody resinous plants, producing naked seeds upon scale-like bracts that are often aggregated in cones; no ovaries are developed and the reproductive organs do not assume a floral design (when leaves are minute and scale-like, they are paired or in whorls of 3—*cf.* whorls of >4 in the superficially similar family *Casuarinaceæ*, No. 61 at beginning of flowering plants in Vol. II [GYMNOSPERMÆ] 29

Flowerless plants, reproducing by spores; sporophyte bearing fronds or scale-like leaves and, when very young, attached to the usually green and plate-like gametophytic generation or *prothallus* [PTERIDOPHYTA] 9

PTERIDOPHYTA (Ferns and fern allies)

9. Plants anchored in mud, either quite submerged or the fronds projecting above water or completely exposed by drought; fronds either simple and long-subulate or 4-lobed and clover-like 10
Plants not as above 11

10. Densely tufted, with a 2- or 3-lobed rootstock; "leaves" *cylindrical*, grass-like, crowded, with flat expanded bases in which the solitary large sporangia are immersed and hidden:

ISOËTACEÆ (p. 53)

Rhizomic, the thread-like or clover-shaped "leaves" arising at intervals; sporocarps conspicuous, globular or hard and bean-shaped:

MARSILEACEÆ (p. 46)

11. Leaves >1" long, usually forming divided fronds that arise from subterranean or epiphytic rhizomes or sometimes from massive trunks; sporangia *never* solitary in the leaf-axils, usually minute and aggregated in sori 14

Leaves small, <1" long (often scale-like), on thin aerial stems, usually crowded and rarely basal; sporangia comparatively large, naked and solitary in the leaf-axils, sometimes situated among modified leaves to form strobili at the ends of branches 12

12. Epiphytic on tree-ferns or growing in rock-crevices; sporangia 2- or 3-locular, >2 mm. long: PSILOTACEÆ (p. 54)

Neither epiphytic nor rock-crevice plants; sporangia 1-locular and <2 mm. long 13

13. Leaves *non-ligulate*; sporangia homogeneous [in *Phylloglossum* the strap-like leaves form a basal tuft and the solitary naked peduncle terminates in a strobilus]; LYCOPODIACEÆ (p. 49)

Leaves with a small *basal ligule*; sporangia of two kinds—large megasporangia toward base and small microsporangia toward apex of each strobilus: SELAGINELLACEÆ (p. 52)

14. Each frond cleft into a vegetative and fertile portion; sporangia about 1 mm. long, sessile in 2 rows at the simple or branched *apex of the fertile portion*, opening by transverse slits:

OPHIOGLOSSACEÆ (p. 9)

Frond not divided into distinct vegetative and fertile portions; sporangia borne on the under-surfaces or edges of the fronds, never attaining 1 mm. in length 15

15. Fertile fronds long-stalked and wiry, with the pinnae small and *congested in appressed pairs* at the very apex where they form a "comb"; sporangia in 2 rows on the inner surfaces of each pinna; annulus of sporangium apical: SCHIZÆACEÆ (p. 11)

Fronds *repeatedly forking* or proliferating and fan-like; sporangia few (often 4) and naked on the under-surfaces of flat linear pinnae or small ovoid pinnules; annulus transverse:

GLEICHENIACEÆ (p. 11)

Fronds not so constructed, neither comb-like *nor* repeatedly forking dichotomously 16

16. Ferns neither very large nor bulky; if developing small trunks, then the fronds either simply pinnate or not elongating beyond 5 ft. 19

Very large ferns, developing upright massive trunks; fronds in horizontal crowns, elongated (typically >5 ft. long when mature), 2- to 3-times pinnate ["tree-ferns"] 17

17. Trunk short and stout, \pm globose; stipes *naked* at base; sporangia occurring promiscuously over the pinnules, stalked, without any definite annulus: OSMUNDACEÆ (p. 10)

Trunk normally elongating, often very tall (to 50 ft.); stipes covered with *hair or scales* at base; sporangia sessile, aggregated in sori, with prominent vertical annulus 18

18. Frond-base *smooth*, but covered with soft, shining, reddish or golden hairs; sori *marginal*, with flap-like indusium:

DICKSONIACEÆ (p. 18)

Frond-base *prickly*, with an indumentum of narrow, flattened, brown or blackish scales; sori *toward mid-vein* of pinnule, circular, the indusium cup-like or absent: CYATHEACEÆ (p. 17)

19. Small *delicate* creeping ferns, mostly epiphytic on tree-fern trunks or covering damp shaded rocks; fronds usually only *one cell thick*; sporangia nearly sessile, borne at the end of a vein and enclosed in a marginal, *valvate or flask-shaped indusium*:

HYMENOPHYLLACEÆ (p. 13)

Fronds and sporangia not as above—if epiphytic, lithophytic or with flask-shaped indusia, then fronds firm in texture 20

20. Sporangia exindusiate, occurring in irregular masses on the under-surfaces of large bipinnate fronds, without a definite annulus:
OSMUNDACEÆ (p. 10)
Sporangia developed in more or less well-defined sori, with prominent vertical or oblique annulus 21
21. Fronds variously divided; if simple or with most lobes not cut to the rhachis, then the sori always indusiate [fertile fronds of *Blechnum* are often very dissimilar to the barren ones, having thicker narrower segments, with sori continuous all over the under-surfaces] 23
Fronds undivided or with primary lobes never cut right to the rhachis, usually of leathery texture; sori exindusiate, never entirely marginal nor borne on distinct fronds (ferns epiphytic or growing on rocks; peltate scales present) 22
22. Venation reticulate; rhizome long-creeping; scales naked; spores bilateral:
POLYPODIACEÆ (p. 30)
Venation divergent; rhizome short and tufted; scales edged with bristles; spores tetrahedral: GRAMMITIDACEÆ (p. 28)
23. Fronds tripinnate, deltoid, rather leathery, shining; sori isolated, with tubular indusia opening onto margins of pinnules (long, stout, creeping rhizome epiphytic or growing in rock-crevices; peltate scales present):
DAVALLIACEÆ (p. 31)
Fronds once-pinnate, narrowing toward each end; sori circular and distant from margin; scales at base of rhachis bearing unicellular hairs (riparian ferns of limestone country, without peltate scales):
THELYPTERIDACEÆ (p. 36)
Fronds variously dissected—if tripinnate and leathery, then the sori neither marginal nor tubular; if only once-pinnate, then sori never circular and scales without hairs (peltate scales never present) 24
24. Rhizomes (and often also the young coiled fronds) clothed entirely with hairs, extensively creeping; fronds large, deltoid, 3- to 4-times pinnate [sori of *Pteridium* and *Histiopteris* almost continuous around margins of pinnules, hair in the latter genus sparse and seldom observed]:
DENNSTÆDTIACEÆ (p. 19)
Rhizomes (and often rhachises) bearing scales; habit various 25
25. Sori quite marginal and indusiate, opening outwards (away from the mid-vein); pinnules cuneate or fan-shaped:
LINDSAYACEÆ (p. 23)
Sori distant from margin or covering the whole under-surface of fertile fronds or, if ever marginal [in *Adiantaceæ*], then without a true indusium (except for recurved flaps of the frond-margin) and opening inwards toward the mid-vein 26
26. Sori entirely marginal, or the sporophyte [in *Anogramma*] a small, delicate, hairless, parsley-like annual with naked sori (rhachis often blackish, lustrous and very slender):
ADIANTACEÆ (p. 23)
Sori not marginal, indusiate [except in *Pleurosorus*, a rock-inhabiting fern covered with brownish woolly hair] 27
27. Sori oblong or linear (when continuous) in lines parallel to the mid-vein; fronds normally always once-pinnate, the fertile often dissimilar to barren ones:
BLECHNACEÆ (p. 41)

Sori oblong or linear, *diverging* from the mid-vein and lateral to secondary veins or, if circular [in *Cystopteris*, a small, rare and very tender alpine fern], then bearing globoid or cowl-shaped indusia 28
Sori *circular*, covered by flattened peltate or reniform indusia (fronds toughish in texture):

ASPIDIACEÆ (p. 38)

28. Upper part of stipe containing an X-shaped (in section) vascular strand; indusium *linear* and only on one side of each vein:

ASPLENIACEÆ (p. 32)

Upper part of stipe with U- or V-shaped vascular strand; indusium *oblong*, or (rarely) circular, and sometimes on both sides of a vein:

ATHYRIACEÆ (p. 36)

GYMNOSPERMÆ (Pines, Cypressess etc., but *not* She-oaks)

29. Leaves *alternate*, *linear*, blunt, to 12 mm. long; seeds 1 or 2 in a leaf axil, each quite exposed at the tip of a *fleshy bract* (alpine and subalpine):

PODOCARPACEÆ (p. 56)

Leaves *minute and scale-like*, in 2's or 3's at close intervals; seeds numerous, *doubly winged*, in globular cones (<1½" long) with *few* valves (up to 10):

CUPRESSACEÆ (p. 56)

Leaves long, *needle-like*, in *fascicles* (usually of 2, 3 or 5); seeds numerous, with *single often deciduous wing*, in ovoid woody cones (>1½" long) having *many* thick overlapping scales:

*PINACEÆ (p. 60)

ANGIOSPERMÆ (Flowering Plants)

[MONOCOTYLEDONEÆ, with 1 seed-leaf—*see* Vol. II for
DICOTYLEDONEÆ, with 2 seed-leaves]

30. Green plants (rarely leafless when in flower, and then perennating by underground bulbs or tubers, or leaves scale-like on a green culm) 32
Herbs *without chlorophyll*, ± *fleshy*; leaves reduced to scales or absent; fruit capsular with minute seeds 31

31. Flowers *zygomorphic*, in spikes or racemes above ground; stamen solitary:

ORCHIDACEÆ (p. 344)

Flowers *regular* (i.e. actinomorphic), solitary, usually hidden under leaf mould; stamens 6 [*Thismia*—rare plant of fern gullies]:

BURMANNIACEÆ (p. 343)

32. Tall palm, unbranched; leaves fan-shaped, 5 ft. in length or more; fruit a small hard drupe in spicate clusters (rare plant of far east):

PALMÆ (p. 267)

Large tussocks, sometimes crowning a massive trunk; leaves very tough, narrow, angular in cross-section, 1-5 ft. long; fruit a horny 3-valved capsule, extremely numerous, dense and sessile along a thick rigid terminal spike (*Xanthorrhæa*):

LILIACEÆ (p. 293)

Habit various; leaves neither very large and fan-shaped *nor* long, tough and angular 33

33. Perianth 0, or of 1 whorl, or of 2 ± similar whorls [flowers sometimes minute, hundreds being densely aggregated in spikes, e.g. *Typhaceæ* and *Araceæ*]

- Perianth of 2 distinct whorls (sepals and petals) differing manifestly from each other in shape, size or colour 34
34. Petals *united* (at least toward the base) into a tube 42
- Petals at last *quite free* (sometimes cohering before expansion) 35
35. Ovary *inferior* or partly so 39
- Ovary *superior* (but sometimes closely appressed to calyx-tube) 36
36. Carpels *and styles* entirely free, or carpels slightly fused at extreme base (leaves radical): ALISMATACEÆ (p. 74)
- Carpels or styles or both obviously united for the greater part 37
37. Flowers *zygomorphic*, with 1 stamen (swamp plant):
- PHILYDRACEÆ (p. 282)
- Flowers *regular* or nearly so (i.e. actinomorphic) 38
38. Flowers *glabrous* internally or, if ever with hairy stamens, then in racemes or panicles: LILIACEÆ (p. 293)
- Flowers \pm *hairy* inside and often on the calyx, solitary or in terminal umbels: *COMMELINACEÆ (p. 281)
39. Perianth *regular* 41
- Perianth *zygomorphic* 40
40. Stamen 1, *fused with style* to form a column:
- ORCHIDACEÆ (p. 344)
- Stamens 3, *free* from style: IRIDACEÆ (p. 329)
41. Outer or both whorls of perianth *sepaloid*:
- HYDROCHARITACEÆ (p. 75)
- Both whorls of perianth *petaloid*; stamens 6:
- AMARYLLIDACEÆ (p. 321)
- As for the last, but stamens 3: IRIDACEÆ (p. 329)
42. Flowers *solitary or racemose*, *zygomorphic*; ovary *inferior*:
- ORCHIDACEÆ (p. 344)
- Flowers in *dense terminal heads* on long scapes; ovary *superior* 43
43. Flowers *conspicuous, yellow*, 3-partite, with penicillate staminodia:
- XYRIDACEÆ (p. 279)
- Flowers *minute, whitish*, 2-partite, without staminodia:
- ERIOCAULACEÆ (p. 280)
44. Perianth wholly greenish and calyx-like, or scarious, or 0 (herbs) 52
- Perianth corolla-like (but sometimes very small), at least the inner segments usually brightly coloured or white 45
45. Perianth-segment 1, lateral, white (aquatic plant):
- *APONOGETONACEÆ (p. 71)
- Perianth-segments 6, regular (or slightly *zygomorphic*) 46
46. Ovary *inferior* 50
- Ovary *superior* 47
47. Perianth dry and *scarious, lustrous, blue or purple*; ovary with solitary ovule (semi-shrub with ericoid foliage):
- CALECTASIACEÆ (p. 292)
- Perianth *not* wholly scarious; ovary with several ovules (foliage not ericoid, but with parallel veins) 48
48. Inflorescence *umbellate*, the 1 to many flowers subtended by 1 or 2 conspicuous, \pm membranous, spathaceous common bracts:
- AMARYLLIDACEÆ (p. 321)

- Inflorescence *not* umbellate or, if so (or the flower solitary), then never subtended by a membranous spathe 49
49. Aquatic plant, the round leaves with inflated bases; flowers \pm zygomorphic, large, mauve; stamens 3 short and 3 long (*Eichhornia*):
*PONTEDERIACEÆ (p. 282)
- Differing in most of the above features: LILIACEÆ (p. 293)
50. Stamen 1 (flowers slightly zygomorphic): ORCHIDACEÆ (p. 344)
Stamens 3 (flowers regular or \pm zygomorphic):
IRIDACEÆ (p. 329)
- Stamens 6 (flowers quite regular) 51
51. Flower solitary or up to 3, yellow; perianth without a tube:
HYPOXIDACEÆ (p. 327)
- Flowers in terminal umbels; perianth with distinct tube:
AMARYLLIDACEÆ (p. 321)
- Flowers in a candelabrum-like panicle 10-30 ft. high; perianth with tube (leaves radical, fleshy, 2-4 ft. long, with marginal prickles and long terminal spine):
*AGAVACEÆ (p. 321)
52. Perianth 0 or represented by scales or bristles (minute in flower, but sometimes elongating in fruit); flowers in the axils of specialized scarious bracts or glumes which are usually *arranged in spikelets* (the spikelets themselves often aggregated in compound inflorescences); leaves always \pm linear and grass-like, sheathing below, the lamina sometimes much reduced 60
Perianth present or, if minute or 0, the flowers not arranged in spikelets *nor* the bracts chaffy; leaves various 53
53. Flowers in heads and/or forming a branched compound inflorescence 58
Flowers in simple or (rarely) twinned spikes 54
54. Perianth of a *single white segment* 10 mm. long or more; anthers 6-12, purple; carpels 3-6, free (rare pond plant with scented flowers in *forked spikes*):
*APONOGETONACEÆ (p. 71)
- Perianth (when present) of >1 segment, usually *greenish*, <5 mm. long (*spikes undivided*) 55
55. Spike with *unisexual* flowers (the male above, sharply demarcated from female below) that are *densely packed* together; perianth microscopic or absent 57
Spike with *bisexual* flowers (homogeneous); perianths easily discernible and *not* compacted, neither surrounded by a spathe *nor* becoming fluffy 56
56. Perianth-segments, carpels and stamens 4:
POTAMOGETONACEÆ (p. 63)
Perianth-segments, carpels and stamens 6 (leaves narrow-linear or filiform):
JUNCAGINACEÆ (p. 71)
57. Leaves narrow-linear, to 6 ft. long; spike naked at anthesis, the flower-mass brown and at last breaking up into copious floss; fruit a microscopic nut:
TYPHACEÆ (p. 62)
Leaves with broad hastate blades, fleshy below; spike surrounded by a large white or greenish spathe; fruit fleshy and berry-like, often 5-10 mm. long:
*ARACEÆ (p. 268)

58. Flowers in panicles, umbels or lateral clusters, *bisexual* (very rarely unisexual and then the inflorescence a large diffuse panicle on a tall naked culm >3 ft. long); perianth of 6 free scarious segments (leaves often reduced to basal sheathing scales):

JUNCACEÆ (p. 283)

Flowers in globoid *heads*, *unisexual*; perianth not as above 59

59. Plants >1 ft. high; heads *several*, without an involucre, interspersed with floral leaves; male and female flowers in separate heads:

SPARGANIACEÆ (p. 63)

Plant <6" high; head *solitary* on a long scape, with an involucre; leaves radical; male and female flowers mixed in same head, minute:

ERIOCAULACEÆ (p. 280)

60. Small, often moss-like annuals (rarely 4" high); flowers in single terminal spikes or heads subtended by 2 or more longer subequal bracts, unisexual with solitary carpels or bisexual with 3 or more carpels; stamen solitary; fruit dehiscent:

CENTROLEPIDACEÆ (p. 276)

Not as above; if small annuals, then the subtending bract solitary (or absent) and the fruit an indehiscent nut 61

61. Flowers (and usually the whole plant) unisexual; perianth-segments 4-6 in *two whorls*; leaves reduced to sheathing bracts (wiry and rush-like perennials):

RESTIONACEÆ (p. 271)

Flowers often bisexual, the plants never diœcious; perianth scale-like in *one whorl* or *absent*; leaves rarely reduced to sheathing bracts 62

62. Stems terete or rarely flattened, usually with *hollow* internodes; leaf-sheath usually *open*, separated from the lamina by a ligule (sometimes much reduced); flower situated between 2 specialized bracts—the *lemma* and *palea* (or the latter occasionally absent):

GRAMINEÆ (p. 78)

Stems terete, flattened or often trigonous; internodes nearly always *solid*; leaf-sheath *closed*, rarely ligulate at its junction with lamina; flower subtended by a single unspecialized bract or glume:

CYPERACEÆ (p. 214)

PTERIDOPHYTA

(Ferns and fern allies)

FILICINÆ

[The first six families in the following arrangement of *Filicinæ* (ferns) were recognized as such in Ewart's *Flor. Vict.* 18-59 (1931), but *Dicksoniaceæ* was merged with the *Cyatheaceæ*. The succeeding 11 families—*Dennstædtiaceæ* to *Blechnaceæ*—were all included by Ewart under *Polypodiaceæ*, in its older and wider sense. This was an artificial assemblage of leptosporangiate ferns, embracing several distinct and unrelated lines of phylogeny. The present subdivision of these *Leptosporangiateæ* into families follows that of A. H. G. Alston, as set out in *Taxon* 5²: 23-25 (Apr. 1956)—a concept differing appreciably from R. E. Holtum's in *Flora of Malaya* 2 (1954) and in *J. Linn. Soc. (Bot.)* 53: 123-158 (1947).]

Family 1. OPHIOGLOSSACEÆ

Sterile blade *simple*, with anastomosing veins; fertile segment *undivided* and spicate (rarely double)

1. *Ophioglossum*

Sterile blade *compound*, the veins free; fertile segment variously *paniculate*

2. *Botrychium*

1. OPHIOGLOSSUM L. (1753)

1. *O. coriaceum* A. Cunn. in Hook. *Compan. Bot. Mag.* 2: 361 (1837).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 57 fig. 7 (1955); Williamson, *Vict. Nat.* 42: 265 fig. 7 (1926); Green in Bond & Barrett, *Vict. Ferns* 58 (1934); Black, *Flor. S. Aust.* ed. 2: fig. 28 (1943); Ewart, *Flor. Vict.* fig. 3 (1931); Dobbie, *N.Z. Ferns* ed. 4: 9 (1951); Fitch in Hooker f., *Flor. Tasm.* 2: t. 169 fig. A, col. (1859), as "*O. vulgatum*".

Vern.: Austral Adder's-tongue. *Dist.*: Throughout Victoria (on moss-covered granitic rocks, loamy pastures, swampy heathland peats, basaltic plains, Mallee sand-hills etc., but often with only very small barren fronds, and consequently overlooked); all Australian States, N.Z., S. Amer.

Diagn.: Rootstock stout, vertical; blade ovate-lanceolate, up to 1" long, net-veined; fertile spike linear, 5-10 mm. long, on slender stalk, 1-6" long, bilateral with a row of several sporangia embedded in each side.

2. BOTRYCHIUM Swartz (1801)

Barren segment *simply pinnate*, 1-3" long, with flabellate pinnæ; fertile segment 1-3" long, with *few* short unilateral branches:

NOTE: On pages 22, 29, 32 and 38 four ferns are attributed to Tristan da Cunha. It is not yet known what vegetation has survived the volcanic eruption of 1961.

2. *B. lunaria* (L.) Swartz in Schrad. *J. Bot., Göttingen* 1800²: 110 (1801).
Osmunda lunaria L. *Spec. Plant.* 2: 1064 (1753).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 57 fig. 5 (1955); Williamson, *Vict. Nat.* 42: 265 fig. 5 (1926); Eaves in Barrett, *Vict. Nat.* 48: 177-178 (1932); Green in Bond & Barrett, *Vict. Ferns* 55 (1934); Nicholls, *Wild Life* 3: 278 (1941); Dobbie, *N.Z. Ferns* ed. 4: 3 (1951); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1279 (1931); Gamble in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 5 (1940); Coste, *Flor. Franc.* 3: fig. 4272 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 8 fig. 2, col. (1906).

Vern.: Moonwort. *Distr.*: In Victoria confined to the eastern highlands, in moist grassy situations above 3000 ft., and very rare (Mt. Howitt, Cobungra, Ram's Horn on Cobboras Mts., Ingeegoodbee River); N.S.W., A.C.T., Tas., N.Z., all continents except Africa.

Barren segment deltoid, 2-3 times pinnate and *parsley-like*, >3" long; fertile segment 3-9" long, *much branched*:

3. *B. australe* R. Br. *Prodr. Flor. Nov. Holl.* 164 (1810).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 57 fig. 6 (1955); Williamson, *Vict. Nat.* 42: 265 fig. 6 (1926); Ewart, *Flor. Vict.* fig. 4 (1931); Dobbie, *N.Z. Ferns* ed. 4: 5 (1951); Fitch in Hooker f., *Flor. Tasm.* 2: t. 169 fig. B, col. (1859), as "*B. virginianum*"; Bailey, *Lithogr. Ferns Qd* 3 (1892), as "*B. ternatum*".

Vern.: Austral Moonwort (Meadow Moonwort). *Distr.*: Scattered in grassy places through eastern Victoria and rare (Melbourne district where now extinct, Strathbogrie, Lima, Wangaratta, Moroka R. near Mt. Wellington, Orbst, Limestone Ck etc.); all States except W.A., but nowhere frequent, N.Z., S. Amer.

Family 2. OSMUNDACEÆ

3. TODEA Willd. (1802)

4. *T. barbara* (L.) T. Moore *Index Fil.* cxix (1857).

Acrostichum barbarum L. *Spec. Plant.* 2: 1072 (1753).

Illust.: Wakefield, *Ferns Vict. Tasm.* 8 fig 1 (1955); Nicholls in Wakefield *l.c.* t. opp. 10 (1955); Galbraith, *Wildflowers Vict.* t. 2 (1950); Williamson in Bond & Barrett, *Vict. Ferns* 30 fig. 6 (1934); Williamson, *Vict. Nat.* 42: 225 fig. 6 (1926); Black, *Flor. S. Aust.* ed. 2: fig. 27 (1943); Ewart, *Flor. Vict.* fig. 12 (1931); Ewart, *Handb. For. Trees* t. 5 (1925); Dobbie, *N.Z. Ferns* ed. 4: 17 (1951); Fitch, *Curtis's bot. Mag.* 98: t. 5954, col. (1872); Fitch in Hooker f., *Flor. Tasm.* 2: t. 168, col. (1859), as "*T. africana*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 137 (1886), as "*Osmunda barbara*"; Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 213 fig. 51 (1915).

Vern.: Austral King-fern (King Fern). *Distr.*: Forest fern gullies at Lower Glenelg R., Grampians, Mt. Cole, Otways, Dandenongs, Wilson Prom. and throughout eastern highlands, usually against water; all States except W.A. (but very localized in S.A.), N.Z., S. Afr.

Diagn.: Trunk massive, hard, short and relatively very thick (2-5 ft. high and broad); fronds to 10 ft. long, numerous, arising in several distinct tufts over trunk, bipinnate, lustrous; sori quite naked, irregularly developed on forked veins under the lanceolate serrate pinnules of lower pinnæ, but often appearing continuous.

Family 3. SCHIZÆACEÆ

4. SCHIZÆA Sm. (1793)

1. Stipe of frond entirely *smooth*, undivided, almost *terete*, < 1 mm. wide; fertile pinnæ *loosely arranged*, almost *glabrous*, < 3 mm. long; no forked sterile fronds present:
5. *S. fistulosa* Labill. *Nov. Holl. Plant. Specim.* 2: 103, t. 250 fig. 3 (1807).
Illust.: Labillardière (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 53 fig. 6 (1955); Black, *Flor. S. Aust.* ed. 2: fig. 26 (1943); Williamson in Bond & Barrett, *Vict. Ferns* 36, fig. 5 (1934); Dobbie, *N.Z. Ferns* ed. 4: 27 (1951); Rodway, *Tasm. Flor.* t. opp. 289 (1903).
Vern.: Narrow Comb-fern. *Dist.*: Scattered on peaty ground of wet heathlands near coast, from Portland district to the New South Wales border (Anglesea, Port Phillip, Wilson Prom., Orbost, Cann R., Genoa etc.), also Grampians; all States except Qd, N.Z., S. Amer., Borneo, ? Madagascar. [A diminutive form occurs in Tasmania and New Zealand, growing as dense clumps even in the alps.]
- Stipe of frond \pm *scabrid*, distinctly *flattened*, about 1 mm. wide; fertile pinnæ *congested*, 3-8 mm. long, *hairy* on the margins 2
2. Plant *slightly roughened*; fronds *simple* or *bifid* (rarely twice divided); sterile fronds *inconspicuous*, not dichotomous:
6. *S. bifida* Willd. in *Nov. Act. Acad. Erf.* 30 t. 3 fig. 3 (1802).
Illust.: Willdenow (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 53 fig. 8 (1955); Wakefield, *Vict. Nat.* 57: 66 (1940), as "*S. fistulosa*"; Williamson in Bond & Barrett, *Vict. Ferns* 36 fig. 6 (1934); Williamson, *Vict. Nat.* 42: 242 fig. 6 (1926); Bailey, *Lithogr. Ferns Qd* 9 A (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 132 (1886), as "*S. dichotoma*".
Vern.: Forked Comb-fern. *Distr.*: Almost co-extensive with *S. fistulosa* on coastal heaths, also among stones in a few hilly areas (e.g. Black Hill near Belgrave, Creswick etc.); all States except W.A., but rare in S.A.
- Plant *manifestly scabrid*; fronds *all twice or thrice dichotomous*, the forked sterile ones *conspicuous* and somewhat *fan-shaped*; fertile pinnæ with long intricate hairs on the margins:
7. *S. asperula* N. A. Wakefield in *Vict. Nat.* 59: 89 (1942).
Illust.: Wakefield, *Ferns Vict. Tasm.* 53 fig. 7 (1955); Wakefield, *Vict. Nat.* 57: 66 (1940), as "*S. bifida*"; Dobbie, *N.Z. Ferns* ed. 4: 31 (1951), as "*S. bifida*".
Vern.: Rough Comb-fern. *Distr.*: Co-extensive with *S. fistulosa* and *S. bifida* on coastal heaths of Southern Victoria (Portland, Grampians, Anglesea, Port Phillip and East Gippsland to the New South Wales border); Tas., S.A. (rare), N.S.W., N.Z.

Family 4. GLEICHENIACEÆ

Ultimate pinnules *rounded* and very small (1-2 mm. long)
 Ultimate pinnules *linear* and much larger (>8 mm. long)

5. *Gleichenia*
 6. *Sticherus*

5. GLEICHENIA Sm. (1793)

Margins of pinnules *strongly recurved* all round (almost obscuring the under-surface), so that sporangia are *enclosed in a pouch*; hairs of rhachises chiefly *lax, mealy-brown* and irregularly fimbriate (brown fimbriate scales also variously developed and more numerous in alpine situations):

8. *G. circinnata* Swartz in Schrad. *J. Bot.*, Göttingen 1800²: 107 (1801).

G. dicarpa R. Br. *Prodr. Flor. Nov. Holl.* 161 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 53 fig. 3 (1955); Williamson in Bond & Barrett, *Vict. Ferns* 36 fig. 2 (1934), as "*G. dicarpa*"; Williamson, *Vict. Nat.* 42: 242 fig. 2 (1926), as "*G. dicarpa*"; Dobbie, *N.Z. Ferns* ed. 4: 41 (1951); Bailey, *Lithogr. Ferns Qd* 15 (1892), as "*G. dicarpa*".

Vern.: Pouched Coral-fern (Wiry Coral Fern). *Distr.*: Frequent on wet heaths and damp forest flats of southern Victoria (Grampians, Otways, Gembrook district and through Gippsland to the New South Wales border), a stunted form ascending into the alps (Baw Baws etc.); Tas., N.S.W., Qd, N.G., N. Cal., N.Z.

Margins of pinnules *flat* or slightly recurved; sporangia always *exposed*; hairs of rhachises all *fasciculate*, bristly and *dark* in colour (plant forming tangled masses, often 10-15 ft. high):

9. *G. microphylla* R. Br. *Prodr. Flor. Nov. Holl.* 161 (1810).

G. circinnata sens. Ewart *Flor. Vict.* 57 (1931), atque auctt. plur., non Swartz (1801).

Illust.: Wakefield, *Ferns Vict. Tasm.* 53 fig. 2 (1955); Nicholls in Wakefield *l.c.* t. opp. 42 (1955), as "*G. circinnata*"; Black, *Flor. S. Aust.* ed. 2: fig. 25 (1943), as "*G. circinnata*"; Williamson in Bond & Barrett, *Vict. Ferns* 36 fig. 1, & t. opp. 44 (1934), as "*G. circinnata*"; Dobbie, *N.Z. Ferns* ed. 4: 39 (1951); Galbraith, *Wildflowers Vict.* t. 3 (1950); Holttum, *Flor. Malaya* 2 (*Ferns*): fig. 15 (1954); Bailey, *Lithogr. Ferns Qd* 14 (1892), as "*G. circinnata*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 136 (1886), as "*G. circinnata*".

Vern.: Scrambling Coral-fern (Umbrella Fern, Parasol Fern). *Distr.*: Not uncommon on heathland, in tea-tree swamps, forest gullies, on scrubby creek-banks etc. of southern Victoria (from the South Australian to New South Wales border), also Grampians, Mt. Buffalo and Upper Murray R.; all States except W.A. (rare in S.A.), N. Cal., N.Z., ? Borneo.

6. STICHERUS C. Presl (1836)

[E. B. Copeland in *Philipp. J. Sci.* 75: 350 (1941) resurrected the genus *Sticherus* for those members of the *Gleicheniaceæ* having elongated ultimate segments to the fronds and few sporangia (up to 6). This view has been adopted by most Australian pteridologists during the last two decades; but R. E. Holttum in *Reinwardtia* 4¹: 257-267 (1957) expresses the opinion that *Sticherus* is not generically separable from *Gleichenia*, and he identifies it with the subgenus *Mertensia* Diels (1902) of *Gleichenia*. In conformity with recent Australian writings on the *Gleicheniaceæ*, and in order to avoid making another new combination for *Sticherus lobatus*, the group is herein retained at the generic level—following Copeland.]

1. Pinnules thin, *membranaceous, lustrous, green on both sides*, conspicuously *denticulate*) (acutely inclined to the rhachises which are almost glabrous):

10. *S. flabellatus* (R. Br.) H. St John in *Occ. Pap. Bishop Mus.* 17: 81 (1942).
Gleichenia flabellata R. Br. *Prodr. Flor. Nov. Holl.* 161 (1810).

Illustr.: Wakefield, *Ferns Vict. Tasm.* 50 fig. 3 (1955); Wakefield, *Vict. Nat.* 60: 109 fig. 3 a & b (1943); White & Goy, *Vict. Nat.* 54: t. 15 opp. 147 (1938); Dobbie, *N.Z. Ferns* ed. 2: 349 (1921); Bailey, *Lithogr. Ferns Qd* 16 (1892)—all, except Wakefield, as "*Gleichenia flabellata*".

Vern.: Shiny Fan-fern. *Distr.*: Very localized in the extreme south-east of Victoria (Boggy Ck near Genoa Peak and jungle gullies of the Howe Ranges), but there forming extensive patches along densely forested creek-flats; abundant in eastern N.S.W. and Qd, extending to N. Cal. and N.Z.

—Pinnules thicker, *not lustrous*, drying \pm greyish beneath, *entire* 2

2. Pinnules *acutely inclined* to axes, their mid-veins usually bearing fine *piliform scales*; rhachises *hairy-scaly* or almost glabrous; primary pinnæ with scattered and almost *entire pinnules* at base of fork:

11. *S. tener* (R. Br.) Ching in *Sunyatsenia* 5: 283 (1940).

Gleichenia tenera R. Br. *Prodr. Flor. Nov. Hall.* 161 (1810);

G. flabellata sens. Ewart *Flor. Vict.* 58 (1931), *non* R. Br. (1810).

Illustr.: Wakefield, *Ferns Vict. Tasm.* 50 fig. 2 (1955); Wakefield, *Vict. Nat.* 60: 109 fig. 2 a & b (1943); Howie in Bond & Barrett, *Vict. Ferns*: t. opp. 17, *col.* (1934); Williamson in Bond & Barrett *l.c.* 36 fig. 3 (1934); Williamson, *Vict. Nat.* 42: 242 fig. 3 (1926); Griffiths, *Wild Life* 6: 203 (1944)—all, except Wakefield, as "*Gleichenia flabellata*".

Vern.: Silky Fan-fern. *Distr.*: Forest fern gullies and shaded creek-banks from the Grampians, Otways, Wombat (Blackwood) and Dandenong Ranges to the New South Wales border, also at Mt. Buffalo; extending into N.S.W. and frequent in Tas.

Pinnules widely diverging (almost *perpendicular* to axes); mid-veins *glabrous*; rhachises with scattered *triangular-lanceolate scales*; bases of primary pinnæ surrounded by clusters of *large lobed pinnules*:

12. *S. lobatus* N. A. Wakefield in *Vict. Nat.* 60: 110 (1943).

Gleichenia lævigata sens. Ewart *Flor. Vict.* 58 (1931), *atque auctt. Aust., non* (Willd.) Hook. (1844).

Illustr.: Wakefield, *Ferns Vict. Tasm.* 50 fig. 1 (1955), *l.c.* t. opp. 42 (1955); Wakefield, *Vict. Nat.* 60: 109 fig. 1 a-d (1943); Williamson in Bond & Barrett, *Vict. Ferns* 36 fig. 4 (1934), as "*Gleichenia lævigata*"; Williamson, *Vict. Nat.* 42: 242 fig. 4 (1926), as "*Gleichenia lævigata*"; Dobbie, *N.Z. Ferns* ed. 4: 25, 51 (1951) Bailey, *Lithogr. Ferns Qd* 18 (1892), as "*Gleichenia flagellaris*".

Vern.: Spreading Fan-fern. *Distr.*: Almost co-extensive with *S. tener* in eastern Victoria, abundant in the jungles and moist mountain-forest slopes of East Gippsland, also in Bunyip R. watershed and Otways but apparently absent from north-eastern districts; frequent through eastern N.S.W. to south-eastern Qd.

Family 5. HYMENOPHYLLACEÆ

1. *Indusium tubular* and somewhat urceolate; receptacle manifestly *exserted*

Indusium *flattened and valvate*; sporangial receptacle almost or quite enclosed 2

2. Segments of frond *denticulate* 7. *Hymenophyllum*
Segments of frond with *entire margins* 8. *Mecodium*

3. Rhizome *filiform*; frond-segments *broadish*, with freely branched veins 9. *Polyphlebium*

Rhizome *strong*; ultimate segments *linear*, with *undivided veins* 10. *Macroglena*

7. HYMENOPHYLLUM Sm. (1793)

Secondary pinnæ *bilaterally arranged*; indusial involucre *obovoid* and irregularly *serrulate*:

13. *H. cupressiforme* Labill. *Nov. Holl. Plant. Specim.* 2: 102, t. 250 fig. 2 (1807).

H. tunbridgense sens. Ewart *Flor. Vict.* 32 (1931), atque auctt. Aust., non (L.) Sm. (1794).

Illust.: Labillardière (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 7, 4 fig. 5 (1955); Wakefield, *Vict. Nat.* 58: 109 fig. 5 (1941); Williamson in Bond & Barrett, *Vict. Ferns* 39 fig. 3 (1934); Williamson, *Vict. Nat.* 42: 222 fig. 3 (1926); Bailey, *Lithogr. Ferns Qd* 30 (1892); Dobbie, *N.Z. Ferns* ed. 2: 56-57 (1921); Ewart, White, Rees & Wood, *Proc. roy. Soc. Vict. new ser.* 24: t. 53 fig. 3 (1912)—all, except Wakefield (and Labillardière), as "*H. tunbridgense*".

Vern.: Common Filmy-fern [not Tunbridge Filmy-fern, as formerly supposed]. *Distr.*: On tree-ferns, logs and moist rocks in mountain gullies (sometimes in mine-shafts, e.g. at Creswick), of southern and north-eastern Victoria—from Darlot's Ck near Portland to the New South Wales border; Tas., N.S.W., Qd (south-east), N.Z., Auckland Is.

Secondary pinnæ *unilateral* (along upper-side of frond-segments); indusial involucre narrow, *ellipsoid* and *entire*:

14. *H. peltatum* (Poir.) Desv. in *Mém. Soc. Linn. Paris* 6: 333 (1827).

Trichomanes peltatum Poir. in *Encycl. méth. (Bot.)* 8: 76 (1806).

Illust.: Wakefield, *Ferns Vict. Tasm.* 4 fig. 6 (1955); Wakefield, *Vict. Nat.* 58: 109 fig. 6 (1941); Morris, *Vict. Nat.* 51: 242 fig. 2 a & b (1935); Ewart, White, Rees & Wood, *Proc. roy. Soc. Vict. new ser.* 24: t. 53 fig. 1 (1912); Dobbie, *N.Z. Ferns* ed. 4: 99 (1951); Holloway, *Trans. N.Z. Inst.* 54: t. 68 opp. 593 (1923).

Vern.: Alpine Filmy-fern. *Distr.*: Not uncommon on damp shaded rocks in alpine and subalpine tracts of Victoria, but rarely found (as at Cumberland Falls) below 4000 ft.—e.g. on Mts. Bogong, Cope, Speculation, Ellery, Baw Baws, Lake Mountain; also Tas., N.S.W. (Kosciusko region), N.Z., Sub-Antarctic islands, S. Amer., S. Afr., W. & S. Europe.

8. MECODIUM C. Presl ex Copeland (1938)

1. Stipes narrowly *winged* almost to the base 3
Stipes *filiform*, *without wings* 2
2. Primary pinnæ *bipinnate*, with *numerous linear segments*; indusial involucre *piluliform*, *wider than its segment*:

15. *M. flabellatum* (Labill.) Copeland in *Philipp. J. Sci.* 67: 21 (1938).

Hymenophyllum flabellatum Labill. *Nov. Holl. Plant. Specim.* 2: 101, t. 250 fig. 1 (1807).

Illust.: Labillardière (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 4 fig. 3 (1955); Wakefield, *Vict. Nat.* 58: 109 fig. 3 (1941); Williamson in Bond & Barrett, *Vict. Ferns* 39 fig. 5 (1934); Williamson, *Vict. Nat.* 42: 222 fig. 5 (1926); Griffiths, *Wild Life* 6: 204 (1944); Rodway, *Tasm. Flor.* t. opp. 288 (1903); Bailey, *Lithogr. Ferns Qd* 30 (1892); Dobbie, *N.Z. Ferns* ed. 4: 83 (1951); Holloway, *Trans. N.Z. Inst.* 54: t. 65 (1923)—all, except Wakefield and Dobbie, as "*Hymenophyllum flabellatum*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 134 (1886), as "*Hymenophyllum nitens*".

Vern.: Shiny Filmy-fern (Shining Filmy-fern). *Distr.*: Rather localized on tree-ferns (chiefly *Dicksonia*), old logs and butts of large trees in shaded mountain gullies from the Grampians, Otways and Mt. Macedon to the New South Wales border; Tas., N.S.W., Qd (south-east), N.Z., Auckland Is and Polynesia (as far east as Tahiti).

—Primary pinnæ with few (1-6) broader segments; involucre comparatively large, *not* wider than the segment in which its base is usually immersed (frond often very narrow):

16. *M. rarum* (R. Br.) Copeland in *Philipp. J. Sci.* 67: 21 (1938).

Hymenophyllum rarum R. Br. *Prodr. Flor. Nov. Holl.* 159 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 4 fig. 2 (1955); Wakefield, *Vict. Nat.* 58: 109 fig. 1 (1941); Williamson in Bond & Barrett, *Vict. Ferns* 39 fig. 4 (1934); Williamson, *Vict. Nat.* 42: 222 fig. 4 (1926); Rodway, *Tasm. Flor.* t. opp. 288 (1903); Dobbie, *N.Z. Ferns* ed. 4: 61 (1951); Holloway, *Trans. N.Z. Inst.* 54: t. 56 (1923)—all, except Wakefield and Dobbie, as "*Hymenophyllum rarum*".

Vern.: Narrow Filmy-fern (Rare Filmy-fern). *Distr.*: On tree-ferns, trunks and rocks in very shaded mountain gullies, and uncommon, from the Otways (where favouring butts of old *Nothofagus* trees) to the New South Wales border—e.g. at Beenak, Warburton, Cumberland Falls, Wilson Prom., Mt. Ellery, Mt. Drummer; Tas., N.S.W., N.Z., Auckland Is.

3. Fronds <8" long, *dark green*; involucre *irregular*, often subapiculate, <2 mm. wide (wing of stipe often *crinkled*):

17. *M. australe* (Willd.) Copeland in *Philipp. J. Sci.* 67: 24 (1938).

Hymenophyllum australe Willd. *Spec. Plant.* 5: 527 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 4 fig. 4 (1955); Nicholls in Wakefield *l.c.* t. opp. 15 (1955); Wakefield, *Vict. Nat.* 58: 109 fig. 4 (1941); Williamson in Bond & Barrett, *Vict. Ferns* 39 fig. 6 (1934) and Williamson, *Vict. Nat.* 42: 222 fig. 6 (1926), as "*Hymenophyllum australe*"; Bailey, *Lithogr. Ferns Qd* 31 (1892), as "*Hymenophyllum javanicum*".

Vern.: Austral Filmy-fern. *Distr.*: Rather frequent on tree-ferns, decaying logs and rocks in mountain gullies, from the Otways and Mt. Macedon to the New South Wales border; Tas., N.S.W., Qd.

—Fronds >8" long (usually much longer), *bright green*; involucre *rotund*, ±2 mm. wide (wing *plane*, very wide along rhachises of pinnæ):

18. *M. dilatatum* (Forst. f.) Copeland in *Philipp. J. Sci.* 67: 24 (1938).

Trichomanes dilatatum Forst. f. *Flor. Ins. Aust. Prodr.* 85 (1786).

Illust.: Wakefield, *Vict. Nat.* 58: 109 fig. 2 (1941); Dobbie, *N.Z. Ferns* ed. 4: 63 (1951); Holloway, *Trans. N.Z. Inst.* 54: t. 62 (1923), as "*Hymenophyllum dilatatum*"; Oliver, *J. Ecol.* 18: t. 1 (1930), as "*Hymenophyllum dilatatum*".

Vern.: Handsome Filmy-fern. *Distr.*: If Victorian, then apparently restricted to the Cumberland Gorge, 9 miles east from Marysville; unknown elsewhere in Australia, but common in N.Z. and reported from Auckland Is.

[The single Victorian discovery was recorded by P.R.H. St John in *Vict. Nat.* 52: 187 (1936), but some doubt attaches to the origin of the specimens in Melbourne Herbarium purporting to have come from Cumberland Gorge.]

9. POLYPHLEBIUM Copeland (1938)

19. *P. venosum* (R. Br.) Copeland in *Philipp. J. Sci.* 67: 55, t. 7 (1938).
Trichomanes venosum R. Br. *Prodr. Flor. Nov. Holl.* 159 (1810).

Illust.: Copeland (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 4 fig. 7 (1955); Nicholls in Wakefield *l.c.* t. opp. 15 (1955); Wakefield, *Vict. Nat.* 58: 109 fig. 7 (1941); Williamson in Bond & Barrett, *Vict. Ferns* 39 fig. 1 (1934); Williamson, *Vict. Nat.* 42: 222 fig. 1 (1926); Griffiths, *Wild Life* 6: 204 (1944); Rodway, *Tasm. Flor.* t. opp. 289 (1903); Bailey, *Lithogr. Ferns Qd* 23 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 133 (1886); Dobbie, *N.Z. Ferns* ed. 4: 113 (1951); Oliver, *J. Ecol.* 18: t. 3 (1930); Holloway, *Trans. N.Z. Inst.* 54: t. 72 (1923)—all, except Copeland, Wakefield and Dobbie, as "*Trichomanes venosum*".

Vern.: Veined Bristle-fern. *Distr.*: On tree-fern trunks in shaded mountain gullies from Otways and Mt. Macedon to the N.S.W. border, rather frequent; Tas., N.S.W., Qd (south), N.Z., Kermadec and Chatham Is.

Diagn.: Rhizome hair-like, long, much branched; fronds pendent, very delicate, translucent, 2-5" long; pinnæ linear, 2-3 mm. wide, crenato-dentate, sometimes lobed at base, prominently veined (veins branching within the lobes); involucre almost axillary toward base of pinnæ, obconic and rather narrowly tubular, 2-3 mm. long, urceolate above; sporangial receptacle filiform, bristle-like, curved and long exserted, 8-15 mm. long.

10. MACROGLENA (C. Presl) Copeland (1938).

20. *M. caudata* (Brackenridge) Copeland in *Philipp. J. Sci.* 67: 84 (1938).
Trichomanes caudatum Brackenridge in *U.S. explor. Exped.* 16: 256, t. 36 fig. 5 (1854);
T. humile sens. Ewart *Flor. Vict.* 31 (1931), non Forst. f. (1786).

Illust.: Brackenridge (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 4 fig. 8 (1955); Wakefield, *Vict. Nat.* 58: 109 fig. 8 (1941); Williamson in Bond & Barrett, *Vict. Ferns* 12 fig. 8 (1934); Williamson, *Vict. Nat.* 42: 303 fig. 8 (1926); Bailey, *Lithogr. Ferns Qd* 28 (1892); Bailey, *Synops. Qd Flor.* suppl. 3 (1890); Copeland, *Philipp. J. Sci.* 51: t. 57 fig. 3-5, t. 58 fig. 1 (1933)—all, except Wakefield, as "*Trichomanes caudatum*".

Vern.: Jungle Bristle-fern (Large Bristle-fern). *Distr.*: On trunks of the two tree-ferns *Cyathea australis* and *C. leichhardtiana*, and very localized in Victoria (viz. Gembrook where rare, jungle gullies at Mt. Drummer and in the Howe Ranges of East Gippsland where locally plentiful, Wilson Prom. near upper Chinaman's Ck); N.S.W., Qd (south), N. Cal., N. Hebr., Fiji, Samoa, Tahiti.

Diagn.: Rhizome stout, darkly hairy-scaly; fronds tufted, rigid, not pendent, with hair-like stipes and winged rachises, bipinnate and much divided, 3-12 cm. long; ultimate segments linear, <1 mm. wide; involucre abundant, axillary to subterminal, stalked, funnel-shaped, about 2 mm. long; receptacle filiform, rigid, 3-10 mm. long but usually short.

[In *Vict. Nat.* 33: 127 (1917) it is reported that P. R. H. St. John exhibited specimens, as new to Victoria, of *Trichomanes parvulum* Poir.—a filmy-fern indigenous

to East African Islands and now referable to the genus *Microtrichomanes*. His material was said to have come from Emerald and Yarra Junction; but the only specimens bearing this name in St. John's herbarium are from Healesville, and are referable to a mixture of *Mecodium flabellatum* and the fern-like hepatic, *Hymenophyllum flabellatum* (Labill.) Dumort. It is probable that the specimens exhibited by St. John at the Victorian Field Naturalists Club were actually of the latter species.]

Family 6. CYATHEACEÆ

11. CYATHEA Sm. (1793)

(incl. *Alsophila* R. Br. (1810) atque *Hemitelia* R. Br. (1810))

1. Secondary pinnæ suddenly contracting toward apex, then caudiform; indusium complete, cup-shaped, enclosing the sporangia until maturity (trunk very slender, to 50 ft. high and to 4" wide; scales at base of frond pale brown with dark central streaking, piliform at apex; veinlets bearing stellate hairs):

21. *C. cunninghamii* Hook. f. in Hook. *Icon. Plant.* 10: t. 985 (1854).

C. medullaris sens. Ewart *Flor. Vict.* 34 (1931) pro parte, non (Forst. f.) Swartz (1801).

Illust.: Fitch in Hooker f. (*l.c.*); Reeves in Wakefield, *Ferns Vict. Tasm.* cover photo. (1955); Wakefield *l.c.* 8 fig. 5 (1955); Reeves, *Wild Life* 6: 201 (1944); Tindale, *Contr. N.S.W. Herb.* 2: t. 12 fig. 2, t. 15 left (1956); Reeves in Galbraith, *Wild flowers Vict.* t. 1 (1950); Griffiths, *Wild Life* 6: 201 (1944); Ewart, *Flor. Vict.* fig. 13 (1931); Williamson in Bond & Barrett, *Vict. Ferns* 30 fig. 4 (1934); Williamson, *Vict. Nat.* 42: 225 fig. 4 (1926); Ewart, *Handb. For. Trees* t. 3 (1925); Mueller, *Key Syst. Vict. Plant.* 2: fig. 135 (1886); Dobbie, *N.Z. Ferns* ed. 4: 141, 143 (1951).

Vern.: Slender Tree-fern. *Distr.*: Scattered in the deepest, shadiest fern gullies of the Otways, Dandenongs (very rare), South Gippsland hills (Bulga & Tarra Valley reserves), Wilson Prom. and East Gippsland (Young's Ck at Orbost, Mt. Drummer etc.), but uncommon and vanishing as a result of fires; also Tas., N.Z., Chatham Is, but not in N.S.W.

—Secondary pinnæ tapering uniformly to an acuminate apex; indusium small and rudimentary, incomplete or absent (basal scales not streaked; veinlets without stellate hairs)

2. Trunk covered almost to the base with pendent remains of old fronds, up to 1 ft. thick; scales at frond-base dark brown; rhachises sparsely mucronate or pimpled; indusium small and irregular, at base of a capitate receptacle:

22. *C. marcescens* N. A. Wakefield in *Vict. Nat.* 59: 33 (1942).

C. medullaris sens. Ewart *Flor. Vict.* 34 (1931) pro parte, non (Forst. f.) Swartz (1801).

Illust.: Wakefield, *Ferns Vict. Tasm.* t. opp. 11, 12 fig. 1-5 (1955); Wakefield, *Vict. Nat.* 59: 34 (1942), *ibid.* 70: t. 4 opp. 13 (1953); Tindale, *Contr. N.S.W. Herb.* 2: t. 11 fig. 4 (1956).

Vern.: Skirted Tree-fern. *Distr.*: Not known outside Victoria, where it is apparently the only endemic species of fern, and localized in four isolated mountain-forest habitats (viz. shaded fern gullies on Parker River in the Otways, Tarra H.P.V. VOL. 1—B

Valley reserve in South Gippsland, Combienbar and Mt. Drummer in East Gippsland). [Trunks in Tarra Valley often lack dead fronds.]

—Trunk bare of dead fronds (except for the upright persistent frond-bases toward apex); indusia absent 3

3. Stipe and rhachises muricate with small conical tubercles; scales at frond-base lanceolate, bright to dark brown, those of costæ ovate and bullate (trunk massive, to 40 ft. high and always much > 5" wide):

23. *C. australis* (R. Br.) Domin *Pteridophyta* 262 (1929).

Alsophila australis R. Br. *Prodr. Flor. Nov. Holl.* 158 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 8 fig. 3 (1955); Nicholls in Wakefield *l.c.* t. opp. 10 (1955); Tindale, *Contr. N.S.W. Herb.* 2: t. 12 fig. 3, t. 15 right (1956); Goy, *Qd Nat.* 12: fig. 1 opp. 46 (1943); Williamson in Bond & Barrett, *Vict. Ferns* 30 fig. 2 (1934); Williamson, *Vict. Nat.* 42: 225 fig. 2 (1926); Rossiter in Ewart, *Handb. For. Trees* t. 2 (1925); Bailey, *Lithogr. Ferns Qd* 34 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 138 (1886); Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 32 fig. 5 (1915)—all, except Wakefield, Tindale and Goy, as "*Alsophila australis*".

Vern.: Rough Tree-fern (Hill Tree-fern). *Dist.*: Frequent in fern gullies and on mountain-sides (even in open forest) from the Otways and Dandenongs through eastern highlands to the New South Wales border, with far-western occurrences in Grampians and Surrey R. near Portland (often persisting in long-cleared paddocks); Tas., N.S.W., Qd (rarer in tropics), ? Norfolk Id.

—Stipe and rhachises aculeate with very dark, straight or curved spines 1-4 mm. long; scales at frond-base narrow-linear (almost filiform), pale grey-brown to almost white, those of the costæ setose on margins and never bullate (trunk slender, to 20 ft. high and < 5" wide):

24. *C. leichhardtiana* (F. Muell.) Copeland in *Philipp. J. Sci. (Bot.)* 6: 360 (1911).

Alsophila leichhardtiana F. Muell. *Fragm. Phyt. Aust.* 5: 53 (1865).

Illust.: Wakefield, *Ferns Vict. Tasm.* 8 fig. 4 (1955); Taylor in Tindale, *Contr. N.S.W. Herb.* 2: t. 10 (1956); Tindale, *l.c.*: t. 13 fig. 2, t. 14 left (1956); Robbins, *Vict. Nat.* 54: t. 7 opp. 47 (1937); Reeves, *Wild Life* 1: 22 (Nov./Dec. 1938); Bailey, *Lithogr. Ferns Qd* 38 (1892)—all, except Wakefield and Tindale, as "*Alsophila leichhardtiana*".

Vern.: Prickly Tree-fern. *Dist.*: In Victoria restricted to East Gippsland and very localized, but abundant enough in the few pockets of jungle on Howe Ranges (near the New South Wales border), at Mt. Drummer, Lower Wigan R. and "Fairy Dell" near Bruthen; N.S.W., Qd.

Family 7. DICKSONIACEÆ

12. DICKSONIA L'Hér. (1788-89)

25. *D. antarctica* Labill. *Nov. Holl. Plant. Specim.* 2: 100, t. 249 (1807).

Illust.: Labillardière (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 8 fig. 2 (1955); Nicholls in Wakefield *l.c.* t. opp. 11 (1955); Audas, *Aust. Bushland* t. opp. 200 (1950); Blake in Goy, *Qd Nat.* 12: fig. 4-5 inter 46 & 47 (1943); Reeves, *Vict. Nat.* 56: t. 3 opp. 56 (1939); Reeves, *Wild Life* 1: 17 (Mar. 1939); Williamson in Bond

& Barrett, *Vict. Ferns* 30 fig. 1 (1934); Williamson, *Vict. Nat.* 42: 225 fig. 1 (1926); Gordon in Ewart, *Handb. For. Trees* t. 1 (1925); Bailey, *Lithogr. Ferns Qd* 40 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 139 (1886), as "*Dicksonia billardieri*".

Vern.: Soft Tree-fern. *Distr.*: In Victoria frequent in the bottoms of forest fern gullies near water, also on damp sheltered mountain-slopes (Lower Glenelg R., Grampians, Blackwood, Mt. Macedon, Otways, Dandenongs, throughout eastern highlands and Gippsland jungles to the New South Wales border; all States except W.A., but presumed extinct in S.A. and not extending north of the Bunya Mts. in Qd.

Diagn.: Trunk massive, rarely higher than 20 ft., soft from a rusty-coloured matting of surface rootlets, which soon overgrow old leaf-bases and may extend toward the ground as buttresses from trunk; fronds tripinnate, to 10 ft. long, invested by soft reddish or golden hairs at base; ultimate pinnules 3-10 mm. long, slightly recurved at margin where coarsely lobed; sori marginal, 1 to each lobe, forming 2-lipped involucre with true indusium on the inner side. (*Hymenophyllaceæ*, *Psilotaceæ* and other epiphytes frequently cover the fibrillose trunks.)

Family 8. DENNSTÆDTIACEÆ

1. Indusium well-developed, *cup-like*, marginal, opening outwards (frond thrice pinnate, with finely dissected and very thin lacy segments)

13. *Dennstædtia*

Indusium *never* cup-like, often rudimentary or absent (but edges of pinnule usually folding back over the sori) 2

2. Sori *elongated* and almost *continuous* around margins of pinnule 4

Sori *circular*, widely separated, arranged in 2 rows on each side of the mid-vein 3

3. Lobes of pinnules *curled over the sori* to form a protective hood; fronds *yellow-green*, \pm leathery and bracken-like 14. *Culcita*

Lobes of pinnules *not* curling over the sori; fronds neither yellowish nor leathery in texture 15. *Hypolepis*

4. Fronds thickish and \pm *leathery* in texture; ultimate segments oblong-linear, *alternate* on rachis; an *inner membranous indusium present* under the revolute margins of pinnules 16. *Pteridium*

Fronds *never* leathery (usually delicate and membranous), *bluish-green*; ultimate segments oblong to broadly lanceolate, always opposite on rachis; *no inner indusium* covering the sori 17. *Histiopteris*

13. DENNSTÆDTIA Bernh. in Schrad. (1801)

26. *D. davallioides* (R. Br.) T. Moore in Park. *Cat.* (1858).

Dicksonia davallioides R. Br. *Prodr. Flor. Nov. Holl.* 158 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 24 fig. 1 (1955); Williamson in Bond & Barrett, *Vict. Ferns* 28 fig. 4 (1934); Williamson, *Vict. Nat.* 42: 301 fig. 4 (1926); Bailey, *Lithogr. Ferns Qd* 42 (1892), as "*Dicksonia davallioides*".

Vern.: Lacy Ground-fern (Creeping Lace Fern). *Distr.*: Not uncommon in deep shaded fern gullies of the Otway Ranges, Vict., also on the rich alluvial soil of jungles along East Gippsland streams (from Lakes Entrance to the New South Wales border), but in a restricted environment; N.S.W., Qd (south-east), Norfolk Id.

Diagn.: Rhizome widely creeping; stipes reddish-brown and shiny; fronds to > 5 ft. high, 3- to 4-times pinnate, dark green, very graceful, of delicate texture, sparsely pubescent on rhachises, otherwise glabrous; primary pinnæ to 1 ft. long; ultimate pinnules with a few blunt lobes, of which the shorter bear bivalvate indusial structures (± 0.5 mm. wide) between their innermost teeth.

14. CULCITA C. Presl (1836)

27. *C. dubia* (R. Br.) Maxon in *J. Wash. Acad. Sci.* 12: 458 (1922).

Davallia dubia R. Br. *Prodr. Flor. Nov. Holl.* 157 (1810).

Illustr.: Wakefield, *Ferns Vict. Tasm.* 24 fig. 2 (1955); Williamson in Bond & Barrett, *Vict. Ferns* 28 fig. 2 (1934), as "*Balanium dubium*"; Williamson, *Vict. Nat.* 42: 301 fig. 2 (1926), as "*Davallia dubia*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 140 (1886), as "*Davallia dubia*"; Bailey, *Lithogr. Ferns Qd* 47 (1892), as "*Davallia dubia*".

Vern.: Common Ground-fern (False Bracken, Rainbow Fern). *Distr.*: Hilly forest land and scrubby creek-flats of Victoria from the Lower Glenelg R. to the New South Wales border (e.g. in Grampians, Otways, Dandenongs, Wilson Prom., and widespread in East Gippsland), often quite abundant in open places; Tas., N.S.W., Qd (extending to tropics).

Diagn.: Very hardy fern, withstanding repeated fires as does bracken (*Pteridium*) and easily cultivated; rhizome stout, long-creeping; stipes almost smooth, pale yellowish; fronds deltoid, firm, yellowish-green, from 6" to almost 5 ft. high, tripinnate, sparsely pubescent along rhachises beneath; pinnules to 1 cm. long, linear-lanceolate, with recurved margins and several blunt lobes; sori on inner side of lobes which often fold over them, obscuring the small scale-like true indusium.

15. HYPOLEPIS Bernh. in Schrad. (1806)

1. Stipe and rhachises *pale* (light olive-brown or yellowish) 3
Stipe and larger rhachises *deep reddish-brown* 2
2. Rhachises *tuberculate*; hairs *few and coarse*; pinnules with *shortly toothed margins* (mature frond broadly triangular, its length and breadth in the ratio of ± 3 to 2):

28. *H. rugosula* (Labill.) J. Sm. in *Curtis's bot. Mag.* 72: Compan. 8 (1846)—
ut "*H. rugulosa*" in err.

Polypodium rugosulum Labill. *Nov. Holl. Plant. Specim.* 2: 92, t. 241 (1807);

H. punctata sens. Ewart *Flor. Vict.* 42 (1931) pro parte, non strict.
(Thunb.) Kuhn (1868).

Illustr.: Labillardière (l.c.); Wakefield, *Ferns Vict. Tasm.* 25 fig. 3 (1955); Wakefield, *Vict. Nat.* 60: 43 fig. 1 (1943); Black, *Flor. S. Aust.* ed. 2: fig. 14 (1943), as "*H. rugosula*"; Dobbie, *N.Z. Ferns* ed. 4: 163 (1951).

Vern.: Ruddy Ground-fern. *Distr.*: Wet shady places along forest streams and in more open swampy situations, from Portland district to the New South Wales border (e.g. Grampians, Wombat Forest, Mt. Macedon, Otways, Dandenong and Strzelecki Ranges, Baw Baws, Barry Mts., and many parts of East Gippsland); S.A. (Mt. Lofty gullies), Tas., N.S.W., N.Z., ? Polynesia.

—Rhachises *asperate*; hairs *numerous, minute*; pinnules each with a few *large, 1-veined lobes* (mature frond narrowly triangular, its length and breadth in the ratio of ± 3 to 1):

29. *H. australis* N. A. Wakefield in *Vict. Nat.* 72: 95 (1955).*Illustr.*: Wakefield, *Ferns Vict. Tasm.* 25 fig. 4 (1955).*Vern.*: Austral Ground-fern. *Distr.*: Scattered along streams in a few mountain-forests of southern Victoria, but uncommon (Otways, Beenak, Warburton, Wongungarra and Arte Rivers); extending to southern Tas. and extreme south-eastern N.S.W.

3. Hairs of rhachises numerous, fine, *very crooked and often clammy* (\pm sticky to touch); sori *marginal, protected* by a small triangular flap or false indusium (frond 2-9 ft. high; rhizome *very robust*):

30. *H. punctata* (Thunb.) Kuhn *Fil. afr.* 120 (1868).*Polypodium punctatum* Thunb. *Flor. japon.* 337 (1784).*Illustr.*: Wakefield, *Ferns Vict. Tasm.* 25 fig. 1 (1955); Wakefield, *Vict. Nat.* 60: 43 fig. 3 (1943); Williamson in Bond & Barrett, *Vict. Ferns* 33 fig. 3 (1934) Dobbie, *N.Z. Ferns* ed. 4: 167 (1951); Bailey, *Lithogr. Ferns Qd* 143 (1892), as "*Polypodium punctatum*".*Vern.*: Downy Ground-fern (Ground Polypody, Rough Hypolepis). *Distr.*: Shaded but not very wet situations in Victorian jungles and mountain-forests where often plentiful (e.g. Lower Glenelg R., Grampians, Otways, Dandenongs, Strzelecki Ranges, Bemm R.); Flinders Id in Bass Strait, N.S.W., Qd, N.G., N.Z., Polynesia, extending to Japan and India.

—Hairs of rhachises few, pale, \pm *straight* and bristle-like; sori usually *distant* from margin, quite *naked* (frond 1-3 ft. high; rhizome *slender*):

31. *H. muelleri* N. A. Wakefield in *Vict. Nat.* 60: 42, 43 fig. 2 (1943).*Illustr.*: Wakefield (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 25 fig. 2 (1955).*Vern.*: Harsh Ground-fern. *Distr.*: Shady jungle gullies of East Gippsland, and more open swampy places in southern Victoria east of Port Phillip, but uncommon in the latter region (Arthur's Seat, Dandenongs, Moc, Stradbroke, Bruthen, Cann R., Mt. Drummer, Genoa etc.); Tas. (north-west), N.S.W., Qd.

[Ewart in *Flor. Vict.* 41 (1931) admitted as Victorian the subtropical species *H. tenuifolia* (Forst. f.) Bernh. in Schrad., which ranges from Queensland through Lord Howe and Norfolk Islands into New Zealand; but his material (from Raymond Creek, East Gippsland) was misidentified and is referable chiefly to *H. rugosula*.]

16. PTERIDIUM Scop. (1760)

32. *P. esculentum* (Forst. f.) Nakai in *Bot. Mag., Tokyo* 39: 108 (1925).*Pteris esculenta* Forst. f. *Plant. escul.* 74 (1786):*Pteridium aquilium* sens. Ewart *Flor. Vict.* 42 (1931), atque auctt. Aust. plur., non (L.) Kuhn (1879).*Illustr.*: Williamson in Wakefield, *Ferns Vict. Tasm.* 44 fig. 1 (1955); Williamson, *Vict. Nat.* 43: 22 fig. 1 (1926), as "*P. aquilinum*"; Black, *Flor. S. Aust.* ed. 2: fig. 16 (1943), as "*P. aquilinum*"; Davey, *J. Dep. Agric. Vict.* 20: 411-413 (1922), as "*Pteris aquilina*"; Dobbie, *N.Z. Ferns* ed. 4: 177 (1951); Bailey, *Lithogr. Ferns Qd* 77 (1892), as "*Pteris aquilina*"; Holttum, *Flor. Malaya* 2 (*Ferns*): fig. 226 (1954).

Vern.: Austral Bracken [not Common Bracken of the Old World, with which formerly confused] ("Rahurahu", "Aruhe"—Maori names). *Distr.*: Abundant almost throughout Victoria from sea-level to the alps (except on basaltic western plains, northern plains and in Mallee), very frequent in mountain country, increasing with successive fires and becoming a major pest on pasture land; all States, but not in the tropics, N. Cal., N.Z., Polynesia.

Diagn.: Rhizome subterranean, very stout, dark and widely creeping, tenacious, densely hairy-scaly near the growing points; fronds deltoid, on long tough stipes (up to 10 ft. on good soils with high rainfall), robust, harsh and leathery in texture, tripinnate; pinnules obtuse, bluntly toothed toward base which forms a decurrent wing along rachis, dark green and glabrous above, paler beneath but with ferruginous hairs on the main veins (young unexpanded fronds succulent and densely hairy); sori continuous along the thickened margins, with true membranous indusium as well as the revolute margin.

[Young tender parts were eaten by aborigines, and the juice is considered effective in relieving ant (and other insect) stings. Poisoning of dairy cattle has been ascribed to bracken (see Gardner & Bennetts *Toxic Plant. W. Aust.* pp. 3-5, 1956).

The widespread Australasian plant has usually been referred to *P. aquilinum* (L.) Kuhn, whose typical form ranges from Britain and Sweden to the Caucasus and almost throughout Africa, while variants extend to South-east Asia and North America. This boreal species differs from *P. esculentum* in its less leathery texture, woolly (not straight) appressed hairs, non-farinaceous appearance of the frond-segments (when viewed from beneath) and, above all, in the absence of decurrent wings to the pinnule-bases (so conspicuous in *P. esculentum*). The varieties *wightianum* (Agardh) Tryon and *yarrabense* Domin of *P. aquilinum* both enter North Queensland from Malaysia; the latter entity has been raised to the rank of species by Wakefield in *Vict. Nat.* 72: 159 (1956).]

17. HISTIOPTERIS Agardh ex J. Sm. (1875)

33. *H. incisa* (Thunb.) J. Sm. *Hist. Fil.* 295 (1875).

Pteris incisa Thunb. *Prodr. Plant. capens.* 171 (1800).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 44 fig. 6 (1955); Williamson, *Vict. Nat.* 43: 22 fig. 6 (1926); Griffiths, *Wild Life* 6: 204 (1944); Dobbie, *N.Z. Ferns* ed. 4: 179 (1951); Galbraith, *Wildflowers Vict.* t. 2 (1950); Holttum, *Flor. Malaya* 2 (*Ferns*): fig. 227 (1954); Bailey, *Lithogr. Ferns Qd* 79 (1892), as "*Pteris incisa*".

Vern.: Bat's-wing Fern (Oak Fern). *Distr.*: Widespread and rather frequent in wet shaded places of Victoria (fern gullies, rocky gorges, swamps etc.) from the Lower Glenelg R. to New South Wales border (e.g. Grampians, Otways, Macedon and Dandenong Ranges, Baw Baws, Barry Mts., Wilson Prom. and many parts of East Gippsland); all States except W.A. and isolated near Haast Bluff in Central Australia (rare in S.A.—Penola), N.Z., Polynesia, Auckland & Campbell Is, Tristan da Cunha, S. Afr., Mascarene Is, India, West Indies, S. Amer.

Diagn.: Rhizome slender, long-creeping; stipes pale, smooth, robust, at first tender and almost succulent, later tough and red-brown to almost blackish; mature fronds 2-6 ft. high, deltoid, 2- to 3-times pinnate, \pm pruinose and blue-green (yellowish in sunnier places); pinnæ and pinnules opposite, broadest below and set at a wide angle so as to appear wing-like; ultimate segments often deeply pinnatifid, with rounded lobes and forked (but not anastomosing) veins; sori almost continuous along margins which form a membranous indusium.

Family 9. LINDSAYACEÆ

18. *LINDSAYA* Dryand. ex Sm. (1793)—ut "*Lindsæa*".

1. Frond *simply pinnate*, linear (2-12" long), with dark polished rhachis and rather distant, usually paired, cuneate or fan-shaped pinnæ (each to 1 cm. wide) which are *obliquely deflexed* when fertile, giving a screw-like appearance to frond:

34. *L. linearis* Swartz in Schrad. *J. Bot., Göttingen 1800*²: 78 (1801).

Illust.: Wakefield, *Ferns Vict. Tasm.* 27 fig. 3 (1955); Wakefield, *Vict. Nat.* 57: 163 fig. 3 (1941.); Williamson, *Vict. Nat.* 42: 303 fig. 6 (1926); Black, *Flor. S. Aust.* ed. 2: fig 11 (1943); Dobbie, *N.Z. Ferns* ed. 4: 151 (1951); Bailey, *Lithogr. Ferns Qd* 51 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 141 (1886).

Vern.: Screw Fern. *Distr.*: Frequent on swampy heaths (often in tangles of grasses or sedges throughout southern Victoria, less common among stones (or on wet clay-soils of flats) in open forest along the Dividing Range and into the north-east; all States, N. Cal., N.Z.

—Frond *bi- or tripinnate*, the fertile segments *never deflexing* 2

2. Ultimate pinnules ± 3 mm. long, *cuneate, truncate*, often equilateral; rhachis *pale yellowish* (frond to 12" long, pale green, with the laciness of a fine maidenhair fern):

35. *L. microphylla* Swartz in Schrad. *J. Bot., Göttingen 1800*²: 79 (1801).

Illust.: Wakefield, *Ferns Vict. Tasm.* 27 fig. 1 (1955); Wakefield, *Vict. Nat.* 57: 163 fig. 1 (1941); Bailey, *Lithogr. Ferns Qd* 54 (1892).

Vern.: Lacy Wedge-fern. *Distr.*: Rare and very localized in Victoria where known only from Karlo Ck near Mt. Drummer, Upper Cann R. Valley, and "Granite Bar" 5 miles north from Welshpool (usually on disturbed clay-soil and man-made excavations); N.S.W., Qd (south-east), N. Cal.

—Ultimate pinnules broad, 4-7 mm. long, *obovate and rounded above*; rhachis *reddish-brown* (frond to 12" long):

36. *L. cuneata* (Forst. f.) C. Chr. *Index Fil.* 392 (1906).

Adiantum cuneatum Forst. f. *Flor. Ins. Aust. Prodr.* 84 (1786).

Illust.: Wakefield, *Ferns Vict. Tasm.* 27 fig. 2 (1955); Wakefield, *Vict. Nat.* 57: 163 fig. 2 (1941); Williamson, *Vict. Nat.* 42: 303 fig. 7 (1926); Dobbie, *N.Z. Ferns* ed. 4: 153 (1951).

Vern.: Oval Wedge-fern. *Distr.*: Known in Victoria only by a single collection from Lilly-pilly Gully (at the head of Tidal R.), Wilson Promontory (Oct. 1909), and perhaps now extinct there; Tas. (Gordon R. area), N.S.W., Qd—but very uncommon and localized throughout its Australian range—N.Z. (where reputed common in the North Id), Fiji.

Family 10. ADIANTACEÆ

1. Sporophyte *annual*, small, *delicate, parsley-like*, entirely glabrous; sori *exindusiate, along the mid-veins* of pinnules 19. *Anogramma*
Sporophyte *perennial*, sori \pm *indusiate*, quite marginal 2

2. Sori *separate and rounded*, in the crenature-sinuses of shortly stalked pinnules; indusia *reniform*; stipe dark reddish-brown to black, often glabrous, \pm wire-like 20. *Adiantum*
Sori *continuous or interrupted* (but not round); indusia, if present, *never reniform*; pinnules often *sessile* 3
3. Stipe *pale*, entirely *smooth* above base (tufted ferns of damp shaded gullies; ultimate segments and continuous sori \pm linear) 21. *Pteris*
Stipe *dark* (red-brown to blackish), \pm *hairy or scaly* 4
4. Frond *simply pinnate*; pinnæ *large* (2-6 cm. long), *stalked*, *entire* or almost so; sori *continuous* 22. *Pellaea*
Frond *twice to several times pinnate*, 1-12" high; ultimate pinnules small (<1 cm.), *sessile*; sori *interrupted* 23. *Cheilanthes*

19. ANOGRAMMA Link (1841)

37. *A. leptophylla* (L.) Link *Fil. Spec. Cult.* 137 (1841).

Polypodium leptophyllum L. *Spec. Plant.* 2: 1092 (1753).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 21 fig. 3 (1955); Williamson, *Vict. Nat.* 43: 58 fig. 3 (1926); Black, *Flor. S. Aust.* ed 2: fig. 23 (1943); Rodway, *Tasm. Flor.* t. opp. 281 (1903) as "*Gymnogramme leptophylla*"; Dobbie, *N.Z. Ferns* ed. 4: 207 (1951); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1286 (1931) as "*Gymnogramme leptophylla*"; Backer & Posthumus, *Varenflor. Java* fig. 31 (1939); Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 19 (1906), as "*Gymnogramme leptophylla*".

Vern.: Annual Fern (Delicate Rue Fern, Small Gymnogramme). *Distr.*: Widespread in Victoria, except for the Mallee and Gippsland districts, on shaded hillsides or damp earth under rock-ledges, but uncommon and becoming rarer (e.g. Black Range south from Horsham, Mt. William, Hexham, Byaduk Caves, Skipton, Lake Burrumbeet, Myrniong, Mt. McIvor, Croydon, Mt. Major near Dookie, Upper Goulburn and Jamieson Rivers); all States except Qd, N.Z. and in cooler parts of both hemispheres, but absent from most of Europe (rare in Britain, France, Switzerland, Mediterranean, Crimea and Caucasus), West Asia and N. Amer. (excepting Mexico).

Diagn.: Prothallus conspicuous, persisting; fronds annual, delicate, glabrescent, pale green, parsley-like, seldom >3 " high, bipinnatisect; pinnæ ± 1 cm. long, rather fan-shaped, with obtuse lobes; sori oblong, 1 per fertile lobe (but finally almost covering under-surface of pinnule), exindusiate.

20. ADIANTUM L. (1753)

1. Pinnules *cuneiform to subrotund*, with slender central attachment; sori *very few* (1-4) and large (fronds broad, pale yellow-green, delicate, 2- to 4-times pinnate):

38. *A. æthiopicum* L. *Syst. Nat.* ed. 10, 2: 1329 (1759).

Illust.: Wakefield, *Ferns Vict. Tasm.* t. opp. 14 (1955); Williamson in Wakefield *l.c.* 16 fig. 1 (1955); Williamson, *Vict. Nat.* 42: 303 fig. 1 (1926); Black, *Flor. S. Aust.* ed. 2: fig. 12 (1943); Dobbie, *N.Z. Ferns* ed. 4: 209 (1951); Bailey, *Lithogr. Ferns Qd* 59 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 142 (1886).

Vern.: Common Maidenhair. *Distr.*: Frequent on creek-banks, damp shaded hillsides and rock-crevices in more open forest and scrub (not in the deep shade of fern gullies) throughout Victoria, excepting the Mallee and drier northern

districts, sometimes appearing on shady stone-walls of railway platforms etc. in Melbourne suburbs; all States (including far N. Qd), Lord Howe Id, N.Z., S. and tropical Africa.

—Pinnules *rhomboid*, asymmetric, with attachment at *lower angle*; sori of median pinnules 5 to numerous 2

2. Rhizome *long, creeping*; fronds 1-4 ft. long, 3- or 4-times divided; pinnules usually *glabrous*, not closely arranged *nor* forming caudiform pinnæ; sori numerous in *shallow* marginal depressions:

39. *A. formosum* R. Br. *Prodr. Flor. Nov. Holl.* 155 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* t. opp. 14 (1955); Williamson in Wakefield *l.c.* 16 fig. 3 (1955); Williamson, *Vict. Nat.* 42: 303 fig. 3 (1926); Dobbie, *N.Z. Ferns* ed. 4: 217 (1951); Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 149 fig. 28 (1915); Bailey, *Lithogr. Ferns Qd* 60 (1892).

Vern.: Black-stem (Giant Maidenhair-fern). *Distr.*: Extremely localized in Victoria where known only from Pipeclay Ck near Orbost and the Cann R. near Noorinbee, but there fairly abundant on the moist rich soil of river-flat jungles (it once grew also on the Snowy-Brodribb flats where now presumed extinct); N.S.W., Qd (to the Cape York Peninsula), N.Z. (between Wairoa and Manawatu Counties in North Id).

—Rhizome *short* (plant tufted); fronds up to 1 ft. long, once to 3-times divided; pinnules finely and sparsely *pubescent*, *close-set* in \pm *caudiform pinnæ*; sori in *deep notches* 3

3. Frond *fan-shaped* in outline; stipe *minutely scabrid*; pinnules olive-green, stiff, almost *papery*, with minute *white hairs*; sori of median segments usually >8 :

40. *A. hispidulum* Swartz in Schrad. *J. Bot., Göttingen* 1800²: 82 (1801).

Illust.: Wakefield, *Ferns Vict. Tasm.* frontispiece (1955); Williamson in Wakefield *l.c.* 16 fig. 2 (1955); Williamson, *Vict. Nat.* 42: 303 fig. 4 (1926); Dobbie, *N.Z. Ferns* ed. 4: 215 (1951); Holttum, *Flor. Malaya* 2 (*Ferns*): fig. 355 (1954); Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 153 fig. 29 (1915); Bailey, *Lithogr. Ferns Qd* 63 (1892).

Vern.: Rough Maidenhair. *Distr.*: Localized in river gorges and jungle gullies of East Gippsland (Deadcock Ck and Mitchell R. gorge, Snowy R. gorge near W Tree, Upper Genoa R., near Genoa Peak, Howe Ranges); N.S.W., Qd, Cent. Aust. (isolated), N.Z., Polynesia, Indonesia, Malaya, S. India, S. Afr.

—Frond *not fan-shaped*, simply pinnate or with only few branches; stipe *smooth*; pinnules dark green, thin, *membranous*, with short *blackish hairs*; sori about 5-8:

41. *A. diaphanum* Blume *Enum. Plant. Jav.* 215 (1828).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 16 fig. 4 (1955); Williamson, *Vict. Nat.* 42: 303 fig. 5 (1926); Dobbie, *N.Z. Ferns* ed. 4: 211, 213 (1951); Bailey, *Lithogr. Ferns Qd* 62 (1892).

Vern.: Filmy Maidenhair. *Distr.*: Known in Victoria only by a single collection from a head of Lang Lang R. ± 12 miles south or south-west from Drouin (1880) and now presumed extinct there; N.S.W., Qd, N.Z., Polynesia, Indonesia, tropical Asia.

21. PTERIS L. (1753)

1. Fronds broad, *tripinnate*; ultimate segments *broad-linear*, not long-ligulate, <1" long 3
Fronds *simply pinnate* (or sparingly bipinnate below); segments *ligulate* and very long (1-6") 2
2. Pinnæ *decurrent* on rhachis, the lower ones *no shorter* than upper and often forked (frond commonly >2 ft. high; stipe *scabrid* below; fertile segments narrow-ligulate and 6" long or more):

42. *P. umbrosa* R. Br. *Prodr. Flor. Nov. Holl.* 154 (1810).

Illust.: Druzenski in Wakefield, *Ferns Vict. Tasm.* t. opp. 43 (1955); Williamson in Wakefield *l.c.* 44 fig. 4 (1955); Williamson, *Vict. Nat.* 43: 22 fig. 4 (1926); Bailey, *Lithogr. Ferns Qd* 74 (1892).

Vern.: Jungle Brake (Shade Brake-fern). *Distr.*: In Victoria confined to the shaded jungles of East Gippsland, but locally abundant (e.g. Mt. Drummer, Brodribb R., 3 miles west-north-west from Bruthen); N.S.W., Qd (localized in N. Qd, but frequent in south).

—Pinnæ *articulate* on rhachis, undivided, with rounded or subcordate bases, the lower *much shorter* than the upper (frond up to 2 ft. high; stipe becoming *hairy* toward the short thick rhizome):

43. *P. vittata* L. *Spec. Plant.* 2: 1074 (1753).

P. longifolia sens. Ewart *Flor. Vict.* 43 (1931), atque auctt. Aust. plur., non L. (1753).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 44 fig. 5 (1955); Williamson, *Vict. Nat.* 43: 22 fig. 5 (1926), as "*P. longifolia*"; Bailey, *Lithogr. Ferns Qd* 72 (1892), as "*P. longifolia*"; Holttum, *Flor. Malaya* 2 (*Ferns*): fig. 230 (1954); Degener, *Ferns & Flowering Plant. Hawaii Nat. Park* t. 9 (1930).

Vern.: Chinese Brake (Long Sickle Fern). *Distr.*: Extremely localized in Victoria where known only from limestone rock-crevices in the Buchan district (Back Ck, Citadel Rocks on Murrindal R. etc.); N.S.W., Qd, W.A. (very rare—Yallingup Caves, Wittenoom Gorge in Hamersley Range), N.G., Polynesia, Indonesia, Japan, China, tropical Asia, Afr. and neighbouring islands, Spain.

3. Rhachis *brown*, polished; segments *pale green*, with *free* divergent veins:

44. *P. tremula* R. Br. *Prodr. Flor. Nov. Holl.* 154 (1810).

Illust.: Nicholls in Wakefield, *Ferns Vict. Tasm.* t. opp. 43 (1955); Williamson in Wakefield *l.c.* 44 fig. 2 (1955); Williamson, *Vict. Nat.* 43: 22 fig. 2 (1926); Black, *Flor. S. Aust.* ed. 2: fig. 15 (1943); Dobbie, *N.Z. Ferns* ed. 4: 181, 183 (1951); Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 157 fig. 30 (1915); Bailey, *Lithogr. Ferns Qd* 76 (1892).

Vern.: Tender Brake (Tender Bracken). *Distr.*: Scattered through Victoria in sheltered forest gullies, along creeks and under damp rock-ledges at the base of cliffs, but locally abundant (Lower Glenelg R., Byaduk Caves, Otways, Dandenongs, Wilson Prom., Mitchell R. gorge, Mt. Ellery, Howe Ranges etc.); S.A., Tas., N.S.W., Qd, Cent. Aust., Norfolk Id, N.Z., Polynesia.

—Rhachis *yellowish*, the stipe with dark brown hairy scales at base; segments *dark green*, with veins *anastomosing* to form a network:

45. *P. comans* Forst. f. *Flor. Ins. Aust. Prodr.* 79 (1786).

Illustr.: Williamson in Wakefield, *Ferns Vict. Tasm.* 44 fig. 3 (1955); Williamson, *Vict. Nat.* 43: 22 fig. 3 (1926); Dobbie, *N.Z. Ferns* ed. 4: 185 (1951); Bailey, *Lithogr. Ferns Qd* 81 (1892).

Vern.: Netted Brake (Netted Bracken, Hairy Bracken). *Distr.*: Confined in Victoria to very wet shaded parts of mountain gullies south of the Dividing Range, but uncommon and not in East Gippsland (Beech Forest and near Apollo Bay in Otways, Clematis Gully in Dandenongs, Tidal R. at Wilson Prom.); Tas. (west and far north-west), N.S.W., Qd (south-east), Lord Howe & Norfolk Is, N.Z. (North Id near sea and rare), Kermadec Is, Polynesia, Juan Fernandez.

22. *PELLÆA* Link (1841)46. *P. falcata* (R. Br.) Fée *Mém. Fam. Foug.* 5: 129 (?1853).

Pteris falcata R. Br. *Prodr. Flor. Nov. Holl.* 154 (1810).

Illustr.: Williamson in Wakefield, *Ferns Vict. Tasm.* 44 fig. 7 (1955); Williamson, *Vict. Nat.* 43: 22 fig. 7 (1926); Dobbie, *N.Z. Ferns* ed. 4: 203 (1951); Bailey, *Lithogr. Ferns Qd* 69 (1892), as "*Pteris falcata*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 145 (1886), as "*Pteris falcata*"; Bower, *The Ferns* 3: 82 (1928).

Vern.: Sickie Fern. *Distr.*: Almost throughout Victoria (except Mallee, Wimmera, and plains) in rocky places near streams, forests and on jungle-flats, but localized and rare in far south-west (e.g. Darlot's Ck, Byaduk Caves); Tas., N.S.W., Qd, N. Cal., N.Z., tropical Asia.

Diagn.: Rhizome coarse, wiry, shortly creeping; fronds close, 6" to 2 ft. long, stiff, erect, linear, simply pinnate, the tip of each young frond often abruptly de-flexed; rachis dark brown, shiny beneath the copious narrow-linear scales; pinnæ up to 2" long, from broadly ovate to narrowly oblong-lanceolate, often slightly curved upwards, ± leathery, dark green above, paler beneath; sorus continuous along margin which is a false indusium.

23. *CHEILANTHES* Swartz (1806)

[incl. *Notholæna* R. Br. (1810)]

Fronds *tripinnatisect*, almost *glabrous* (sometimes a few scales on stipe), often 6-12" long:

47. *C. tenuifolia* (Burm. f.) Swartz *Synops. Fil.* 129, 332 (1806).

Trichomanes tenuifolia Burm. f. *Flor. ind.* 237 (1768).

Illustr.: Hedwell in Chippendale, *Poison. Plant. N. Terr.* Pt. 2: fig. 1 (1958); Wakefield, *Ferns Vict. Tasm.* 16 fig. 5 (1955); Williamson in Bond & Barrett, *Vict. Ferns* 28 fig. 6 (1934); Williamson, *Vict. Nat.* 42: 301 fig. 6 (1926); Black, *Flora S. Aust.* ed. 2: fig. 13 (1943); Dobbie, *N.Z. Ferns* ed. 4: 193, 195 (1951); Holttum, *Flor. Malaya 2 (Ferns)*: fig. 347 (1954); Bailey, *Lithogr. Ferns Qd* 65-66 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 144 (1886).

Vern.: Rock Fern (Rock Lip Fern). *Distr.*: Frequent almost throughout Victoria, except the Mallee, favouring rather exposed rocky situations (among granite rocks often 1-2 ft. high, but on flat pastures and basalt plains the fronds mature when only 1-2" high); all States, Cent. Aust., N.G., N.Z., N. Cal., Polynesia, Indonesia, S.E. Asia and probably tropical Africa.

[The var. *sieberi* (Kunze in Lehm., *ut sp.*) Hook. f. *Handb. N.Z. Flor.* 362 (1864) appears to be co-extensive in Victoria; it is distinguished by shorter rhizomes and linear fronds with short, rather remote lower branches. This population

was retained at the specific level by Ewart in *Flor. Vict.* 41 (1931); but, among the many forms now included under *C. tenuifolia*, it is often difficult to decide where the typical condition ends and *C. sieberi* Kunze in Lehm. *Plant. Preiss.* 2: 112 (1847) begins. Some authorities favour restricting *C. tenuifolia* in the narrowest sense to tropical north-eastern Australia, and assigning all southern populations (including Victorian) to *C. sieberi*.]

—Fronds *bipinnatisect*, bearing flattened hair-like scales on rachises and copiously on the under-surfaces of pinnæ, narrow and rarely to 6" long:

48. *C. distans* (R. Br.) Mett. in *Abh senckenb. naturf. Ges.* 3: 69 (1859).

Notholæna distans R. Br. *Prodr. Flor. Nov. Holl.* 146 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 16 fig. 6 (1955); Williamson in Bond & Barrett, *Vict. Ferns* 28 fig. 1 (1934); Williamson, *Vict. Nat.* 42: 301 fig. 1 (1926); Black, *Flor. S. Aust.* ed. 2: fig. 17 (1943); Dobbie, *N.Z. Ferns* ed. 4: 197 (1951); Bailey, *Lithogr. Ferns Qd* 171 fig. 3 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 143 (1886)—all, except Wakefield, Dobbie and Mueller, as "*Notholæna distans*".

Vern.: Bristly Cloak-fern. *Distr.*: Scattered almost throughout Victoria on dryish rocky hills (e.g. Black Range south from Horsham, Bendigo, Graytown, Wodonga, Towong, Suggan Buggan, Buchan, Macallister R.), but mostly uncommon; all States except Tas., N.Z. (localized), Polynesia, Celebes.

—Fronds *bipinnatisect*, wholly blanketed with a mixture of woolly hairs and scales, rarely 6" long (very rare fern of far north-west Mallee):

49. *C. lasiophylla* Pichi-Sermolli in *Webbia* 8: 209, fig. 3-6 (1951).

Nothochlæna canescens Kunze in Lehm. *Plant. Preiss.* 2: 110 (1846),
non *C. canescens* Kunze (1839);

Notholæna vellea sens. auctt. non strict. R. Br. (1810);

N. brownii sens. auctt. Aust. plur., non Desv. (1827).

Illust.: Pichi-Sermolli (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 16 fig. 7 (1955).

Vern.: Woolly Cloak-fern. *Distr.*: Extremely rare in Victoria, where known only by a single collection (Sept. 1948) from calcareous cliffs of Murray R. at Boundary Point (within a few chains of the South Australian border); inland parts of all States except Tas., chiefly on rock outcrops and arid mountain ranges (e.g. Barrier, Flinders, Musgrave and Hammersley Ranges); also The Granites, Macdonnell Ranges, etc., in N. Terr.

[This species was formerly confused with the less common, tropical *C. vellea* (R. Br.) F. Muell.—syn. *Notholæna brownii* Desv.—in which the woolly indumentum is paler, consisting entirely of septate hairs.]

Family 11. GRAMMITIDACEÆ

Frond *ligulate*, *entire* (rarely with a few large irregular lobes toward apex) sori *oblong to linear*, diverging from mid-vein in 2 rows and sometimes so crowded as to coalesce

24. *Grammitis*

Frond *pinnatifid* or *pinnate* (if occasionally simple, then *regularly crenate* along margins); sori *oval*, always separated, usually 1 per lobe

25. *Ctenopteris*

24. GRAMMITIS Swartz in Schrad. (1801)

50. *G. billardieri* Willd. *Spec. Plant.* 5: 139 (1810).

Polypodium billardieri (Willd.) C. Chr. *Index Fil.* 513 (1906),
non R. Br. (1810).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 21 fig. 4 (1955); Williamson, *Vict. Nat.* 43: 58 fig. 4 (1926), as "*Polypodium billardieri*"; Howie in Bond & Barrett, *Vict. Ferns* t. opp. 48, col. (1934), as "*Polypodium billardieri*"; Griffiths, *Wild Life* 6: 205 (1944), as "*Polypodium billardieri*"; Dobbie, *N.Z. Ferns* ed. 4: 374 A (1951); Bailey, *Lithogr. Ferns Qd* 140 (1892), as "*Polypodium australe*".

[The morphogenesis of prothalli from germinating spores is admirably illustrated by Ilma G. Stone in *Aust. J. Bot.* 8: 14, 16, 18, 24, 26, 28, 30, 32, t. 1 & 2 (1960).]

Vern.: Finger Fern. *Distr.*: Frequent in fern gullies of Victorian mountain-forests (ascending to the alps) and in East Gippsland jungles, growing usually on the mossy limbs and boles of rain-forest trees, but also on tree-fern trunks, fallen logs and damp rocks (e.g. Otway, Dandenong and Strzelecki Ranges, Baw Baws, Wilson Prom., Mt. Kaye, Genoa Peak, Upper Genoa R., Mt. Buller, Mt. Speculation); Tas., N.S.W., Qd, N.G., N.Z., Auckland, Campbell & Macquarie Is, Tristan da Cunha, S. Afr., S. Amer. (Chile).

Diagn.: Rhizome short, shaggy with pallid scales; fronds tufted, entire, up to 6" long, linear, obtuse, narrowed into a short stipe, rather thick, with divergent veins and sometimes undulate margins, occasionally with a forked apex or few irregular terminal lobes; sori naked, oblong or linear, in two rows (on each side of mid-vein to which they are steeply inclined).

[*G. billardieri* is characteristically an epiphyte on mossy trunks in wet forest gullies, its fronds being 2-6" long and 3-10 mm. wide; but, in sheltered rock-crevices of the Bogong alps, occurs a diminutive form having indurated fronds less than 1" long and only 1-2 mm. wide. This dwarfed population is apparently referable to *G. pumila* J. B. Armstrong in *Trans. N.Z. Inst.* 13: 341 (1882), described from the southern alps of New Zealand. On the Victorian Baw/Baws transitional states occur, and it is thought prudent to regard *G. pumila* as no more than an example of nanism due to environment—so often observed among our alpine representatives of widespread lowland species.]

25. CTENOPTERIS Blume (1830)

51. *C. heterophylla* (Labill.) M. D. Tindale in *Amer. Fern. J.* 41: 100, t. 6 (1951).

Grammitis heterophylla Labill. *Nov. Holl. Plant. Specim.* 2: 90, t. 239 (1806);

Polypodium grammitidis R. Br. *Prodr. Flor. Nov. Holl.* 147 (1810).

Illust.: Tindale (*l.c.*); Labillardière (*l.c.*); Williamson in Wakefield, *Ferns Vict. Tasm.* 21 fig. 5 (1955); Williamson, *Vict. Nat.* 43: 58 fig. 5 (1926), as "*Polypodium grammitidis*"; Howie in Bond & Barrett, *Vict. Ferns* t. opp. 48, col. (1934), as "*Polypodium grammitidis*"; Dobbie, *N.Z. Ferns* ed. 4: 380 (1951), as "*C. grammitidis*". [See also Ilma G. Stone in *Aust. J. Bot.* 8: 20 & 22 (1960) for illustrations of spores and young gametophytes.]

Vern.: Gipsy Fern. *Distr.*: Occasional in the wetter fern gullies of southern and eastern Victoria, growing on mossy limbs, tree-trunks and rocks (Otways, Dandenongs where rare, Strzelecki Ranges, Wilson Prom., Combienbar R.,

Cann R., Wingan R., Mt. Drummer, Genoa R. gorges within 8 miles of the N.S.W. border); Tas. (including Strzelecki Peaks on Flinders Id) where locally plentiful, N.Z., Chatham Id.

Diagn.: Rhizome short, chaffy-scaly; stipes crowded, distinctly winged; fronds up to 1 ft. long, deeply pinnatifid or pinnate (rarely almost entire), slightly leathery; pinnae narrow, linear, attached by broad decurrent bases, erectopate, rather distant, of unequal lengths, with \pm lobed or even pinnatifid margins; sori naked, oval to oblong, slightly oblique, usually 1 per lobe of each pinna and set well back from margin.

Family 12. POLYPODIACEÆ

Rhizome long-creeping, *very slender*; fronds up to 4" long, *never undulate, very thick and leathery*, their under-surfaces covered with a felty mat of *pale stellate scales*; sori *crowded*, often coalescing

26. *Pyrrosia*

Rhizome stout; fronds >4" long, \pm undulate at margins, never thick, *glabrous beneath* or with some *dark narrow scales* on mid-veins; sori *distant, rounded*, their insertions manifest on upper surface of frond

27. *Microsorium*

26. PYRROSIA Mirb. (1803)

52. *P. rupestris* (R. Br.) Ching in *Bull. Chin. bot. Soc. 1*: 49 (1935).

Polypodium rupestre R. Br. *Prodr. Flor. Nov. Holl.* 146 (1810);

Cyclophorus serpens sens. Ewart *Flor. Vict.* 45 (1931), atque auctt. Aust., non (Forst. f.) C. Chr. (1905).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 21 fig. 1 (1955); Williamson, *Vict. Nat.* 43: 58 fig. 1 (1926), as "*Cyclophorus serpens*"; Goy, *Qd Nat.* 10: t. 4, opp. 46 (1937), as "*Cyclophorus rupestris*"; Bailey, *Lithogr. Ferns Qd* 151 (1892), as "*Polypodium serpens*".

Vern.: Rock Felt-fern (Creeping Polypody). *Distr.*: In Victoria, except for a single isolated occurrence in the Dandenong Ranges (head of Sherbrooke Forest gully), confined to East Gippsland but there often abundant on the trunks and limbs of jungle trees and on sheltered rock-faces, often accompanying *Dendrobium striolatum* (Mitchell R. gorge country, Lakes Entrance where now rare, Stradbroke Chasm near Suggan Buggan, Mt. Drummer, Upper Genoa R., Howe Ranges etc.); N.S.W., Qd. [In N.Z. this species is replaced by *P. serpens* (Forst. f.) Ching.]

Diagn.: Rhizome very long, slender, extensively branched and creeping, often quite exposed, covered with pale fugacious scales; fronds entire, shortly stalked, very thick and leathery, covered beneath with a dense, silvery, stellate-scaly indumentum, the rounded barren fronds to 1" long, the narrower fertile ones 1-4" long; sori oval, crowded, often almost obscuring the under-surfaces.

27. MICROSORIUM Link (1833)

Frond *firm* (slightly leathery in texture), *odourless*, entire or irregularly divided into few *large distant lobes* which are 3-12" long and 1" apart; sori usually *remote from margin*; scales of rhizome *appressed, deciduous*:

53. *M. diversifolium* (Willd.) Copeland in *Univ. Calif. Publ. Bot.* 16: 114 (1929).

Polypodium diversifolium Willd. *Spec. Plant.* 5: 166 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* t. opp. 22 (1955), also Williamson in Wakefield *l.c.* 21 fig. 6 (1955)—both as "*Phymatodes diversifolia*"; Williamson, *Vict. Nat.* 43: 58 fig. 6 (1926), as "*Polypodium diversifolium*"; Ewart, *Flor. Vict.* fig. 14 (1931), as "*Polypodium diversifolium*"; Dobbie, *N.Z. Ferns* ed. 4: 205, 370 (1951); Griffiths, *Wild Life* 6: 202, 203 (1944), as "*Polypodium diversifolium*"; Bailey, *Lithogr. Ferns Qd* 159 (1892), as "*Polypodium pustulatum*"; Pichi-Sermolli, *Webbia* 8: 217 fig. 9, 219 fig. 10 (1951), as "*Polypodium diversifolium*".

Vern.: Kangaroo Fern. *Distr.*: In Victoria frequent and widespread in jungles and fern gullies from sea-level to the alps, growing vigorously on mossy trunks, limbs, tree-ferns, fallen logs and rocks (often in crevices), also in caves of more exposed country (Darlot's Ck near Portland, Byaduk Caves, Mt. Macedon, Otways, Dandenongs, Strzelecki Ranges, Wilson Prom. and many parts of East Gippsland); Tas., N.S.W., Qd, Norfolk Id, N. Cal., N.Z., Kermadec, Chatham, Campbell & Auckland Is.

Fronde membranous, faintly aromatic when fresh, typically cut into numerous regular lobes which are 2-3" long, <1" apart and tapered to acuminate points; sori close to margin; scales of rhizome squarrose, persistent:

54. *M. scandens* (Forst. f.) M. D. Tindale in *Amer. Fern J.* 50³: 241 (1960). *Polypodium scandens* Forst. f. *Flor. Ins. Aust. Prodr.* 81 (1786), non Labill. (1806);

Polypodium pustulatum sens. Ewart *Flor. Vict.* 47 (1931), atque auctt. Aust., non Forst. f. (1786).

Illust.: Wakefield, *Ferns Vict. Tasm.* t. opp. 22 (1955), also Williamson in Wakefield *l.c.* 21 fig. 7 (1955)—both as "*Phymatodes scandens*"; Williamson, *Vict. Nat.* 43: 58 fig. 7 (1926), as "*Polypodium pustulatum*"; Dobbie, *N.Z. Ferns* ed. 4: 368 (1951), as "*Microsorium pustulatum*"; Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 179 fig. 40 (1915), as "*Polypodium pustulatum*"; Bailey, *Lithogr. Ferns Qd* 160 (1892), as "*Polypodium scandens*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 151 (1886), as "*Polypodium pustulatum*"; Pichi-Sermolli, *Webbia* 8: 215 fig. 8 (1951), as "*Polypodium scandens*".

Vern.: Fragrant Fern (Scented Polypody). *Distr.*: Lilly-Pilly Gully on Wilson Prom., otherwise confined in Victoria to the jungle country of East Gippsland where frequent on tree-ferns, trunks, mossy limbs and moist shaded rock faces, often growing in dense profusion (Mitchell R. gorges, Orbost, Mt. Drummer, Howe Ranges etc.); N.S.W., Qd, N.Z., Chatham Is.

Family 13. DAVALLIACEÆ

28. DAVALLIA Sm. (1793)

55. *D. pyxidata* Cav. *Descr. Plant.* 278 (1802).

Illust.: Wakefield, *Ferns Vict. Tasm.* 41 fig. 2 (1955); Williamson in Bond & Barrett, *Vict. Ferns* 28 fig. 3 (1934); Williamson, *Vict. Nat.* 42: 301 fig. 3 (1926); Griffiths, *Wild Life* 6: 203 (1944); Bailey, *Lithogr. Ferns Qd* 45 (1892).

Vern.: Australian Hare's-foot (Cup Hare's-foot, Victorian Hare's-foot Fern, Fairy Fern). *Distr.*: Very localized in Victoria, where known with certainty only from fissures in rather dry sandstone cliffs at Mt. Bepcha, Talbot Peak and Picnic Rocks (all in the Black Range area between Horsham and Cavendish, far western Vict.); also N.S.W. (not infrequent north of the Illawarra district), Qd, Norfolk Id, N. Cal. [Often cultivated in hanging baskets and very decorative.]

Diagn.: Rhizome stout, long-creeping, densely covered with chaffy-hairy, reddish-brown scales; stipes pale, smooth; fronds deltoid, rarely > 1 ft. long, tripinnate, leathery, glabrous, lustrous, with narrowly winged minor rhachises; pinnules bluntly toothed, 5-10 mm. long, ovate-lanceolate; sori at base of marginal indentations, with tubular or cup-like indusia \pm 1 mm. long.

[A very different-looking species (now assigned to the *Davalliaceæ* by virtue of its peltate scales) is the tropical Fishbone Fern, *Nephrolepis cordifolia* (L., ut *Polypodium* sp.) C. Presl *Tent. Pterid.* 79 (1836). Although hardly naturalized in Victoria, *N. cordifolia* is very commonly grown almost throughout the State; its long, narrow graceful, pale yellowish-green fronds are simply pinnate, with crenulate blunt segments and reniform indusia, while the extensively creeping slender rhizomes and hairy globular tubers aid it in occasional escapes from the fernery or suburban garden. This plant ranges from Japan to north-eastern Australia and New Zealand, with an isolated occurrence in Central Australia near Haast Bluff.]

Family 14. ASPLENIACEÆ

Frond *glabrous* or almost so, often shining; indusia *well developed*

29. *Asplenium*

Frond *blanketed with copious hairs*; indusia *absent*

30. *Pleurosorus*

29. ASPLENIUM L. (1753)

- | | |
|--|---|
| 1. Frond bi- or tri-pinnate | 5 |
| Frond simply pinnate | 2 |
| 2. Pinnæ very <i>thick and leathery</i> in texture, lustrous, <i>never</i> oblique at base, 1-3" long, obtuse to acuminate, bluntly or sharply toothed; stipe fleshy, <i>wholly green</i> ; rhizome short and very stout, with large purplish linear-lanceolate scales (rare coastal plant): | |

56. *A. obtusatum* Forst. f. *Flor. Ins. Aust. Prodr.* 80 (1786).

A. scleroprium Hombron & Jacquinot in *Voy. Pôle Sud, Atlas*:
t. 1 fig. D (1844).

Illust.: Wakefield, *Ferns Vict. Tasm.* t. opp. 31 (1955); Williamson in Wakefield *l.c.* 33 fig. 7 (1955); Williamson, *Vict. Nat.* 43: 117 fig. 7 (1926); Dobbie, *N.Z. Ferns* ed. 4: 330 (1951); Dobbie *l.c.* 338 (1951), as "*A. scleroprium*"; Bailey, *Lithogr. Ferns Qd* 105 (1892).

Vern.: Shore Spleenwort. *Distr.*: Very localized in Victoria, occurring only in rock-crevices against the sea (and frequently wetted with salt spray) at Lady Julia Percy Id, Cape Woolamai on Phillip Id, Wilson Prom. and a few neighbouring islands (Snake, Clifty etc.), Ram Head near Wingan Inlet and cliffs south from Mallacoota in far East Gippsland; Tas. (including Furneaux Group) where not infrequent on coast, N.S.W., ? Qd, ? W.A. (very rare), N.Z., Sub-Antarctic islands, Tristan da Cunha, Chile.

[Ewart in *Flor. Vict.* 52 (1931), Wakefield in *Vict. Nat.* 57: 114 (1940) and other authors have variously treated *A. scleroprium* as a distinct species or as a variety of *A. obtusatum*, *A. lucidum* and even *A. flaccidum*—based upon its longer (to 3"), *acuminate*, *more deeply incised pinnules*; but, in textural character and scalation, it is inseparable from *A. obtusatum*, and individual specimens exhibit transitions in the pinnule morphology.]

—Pinnæ *not* thickened, \pm *membranous*, sometimes oblique at base; stipe *dark below*, often blackish (seldom on coasts or, if so, *not* exposed to ocean spray) 3

3. Pinnæ 4-8 cm. long, *lanceolate*, *acuminate*; veins \pm *parallel*, *conspicuously raised* on upper surface (very rare fern of East Gippsland):

57. *A. falcatum* Lam. in *Encycl. méth. (Bot.)* 2: 306 (1786).

A. adiantoides sens. C. Chr. *Index Fil.* 99 (1905), *non* (L.) Lam. (1786).

Illust.: Wakefield, *Ferns Vict. Tasm.* 32 (1955); Wakefield, *Vict. Nat.* 57: 115 fig. 1 (1940), as "*A. adiantoides*"; Dobbie, *N.Z. Ferns* ed. 2: 229 (1921); Holttum, *Flor. Malaya* 2 (*Ferns*): fig. 250 (1954); Oliver, *J. Ecol.* 18: t. 6 phot. 7 (1930); Ogata, *Icon. Fil. japon.* 3: t. 102 (1930); Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 97 fig. 19 (1915); Bailey, *Lithogr. Ferns Qd* 104 (1892)—all, except Wakefield and Bailey, as "*A. adiantoides*".

Vern.: Willow Spleenwort (Sickle Spleenwort). *Distr.*: Extremely rare and localized in Victoria, where known only from a single plant on shaded granite rock-wall 2 miles south-east from Genoa in far East Gippsland, but this plant has died since its discovery in 1940; N.S.W., Qd, N.G., N.Z. (frequent), Polynesia, Indonesia, Malaya, India, E. Afr., Mauritius.

—Pinnæ much <4 cm. long, either *fan-shaped*, *suborbicular* or \pm *elliptic*; venation *inconspicuous* 4

4. Frond *lax*, *trailing*, often *rooting* at the flagelliform tip; stipe only *dark toward base*; pinnæ *fan- to wedge-shaped*, often deeply crenate, 5-25 mm. long:

58. *A. flabellifolium* Cav. *Descr. Plant.* 257 (1802)—ut "*A. flavelifolium*" in err.

Illust.: Lee in Wakefield, *Ferns Vict. Tasm.* t. opp. 30 (1955); Williamson in Wakefield *l.c.* 33 fig. 3 (1955); Williamson, *Vict. Nat.* 43: 117 fig. 3 (1926); Black, *Flor. S. Aust.* ed 2: fig. 19 (1943); Dobbie, *N.Z. Ferns* ed. 4: 320 (1951); Bailey, *Lithogr. Ferns Qd* 102 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 149 (1886).

Vern.: Necklace Fern. *Distr.*: Frequent throughout Victoria, excepting northern plains and Mallee, growing usually in rock-crevices but occasionally on soil or tree-trunks in fern gullies (e.g. Lower Glenelg R., Byaduk Caves, Grampians, Pyrenees, Mt. Macedon, Otways, Dandenongs, Baw Baws, Wilson Prom., Alps, East Gippsland etc.); temperate parts of all States, N.Z.

—Frond *rigid*, *suberect*, *never rooting* at tips; stipe and rhachis *black and shining throughout*; pinnæ *ovate-elliptic to suborbicular*, slightly crenate, <8 mm. long:

59. *A. trichomanes* L. *Spec. Plant.* 2: 1080 (1753).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 33 fig. 4 (1955); Williamson, *Vict. Nat.* 43: 117 fig. 4 (1926); Wakefield, *Vict. Nat.* 57: 115 fig. 5 (1940); Dobbie, *N.Z. Ferns* ed. 4: 324 (1951); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1299 (1931); Bonnier, *Flor. Compl. Franc. Suisse & Belg.* 12: t. 709, col. (1934); Hubbard, *Hawaii Nature Notes* 5: central t. [6] (1952); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 5 fig. 2; col. (1906).

Vern.: Common Spleenwort (Maidenhair Spleenwort, Black Spleenwort). *Distr.*: Scattered through cooler parts of Victoria in rock-crevices or on sheltered rockledges, usually of limestone formation, but uncommon and rarely seen (Lower Glenelg R., Snob's Ck Falls, Mt. Buffalo, Bindi Ck, Buchan, Murrindal R., Boundary Ck near Wulgulmerang, Cobungra R., Mt. St. Bernard, Limestone

Ck near source of Murray R.); W.A., S.A. (Mt. Gambier and rare), Tas., N.S.W., N.Z., temperate regions generally and on high mountains in tropics.

5. Ultimate segments *close*, very narrowly *fan- to wedge-shaped* (their lobes with *parallel sides*), \pm *leathery*, up to 1 cm. long; sori *elongated*; veins *conspicuous and parallel* (frond rarely >1 ft. long; stipe often dark, toward its base bearing *fimbriate scales with flagellæ*):

60. *A. adiantoides* (L.) Lam. in *Encycl. méth. (Bot.)* 2: 309 (1786).

Trichomanes adiantoides L. *Spec. Plant.* 2: 1098 (1753);

A. præmorsum Swartz *Nov. Gen. & Spec. Plant., Prodr.* 130 (1788).

Illust.: Ponder in Wakefield, *Ferns Vict. Tasm.* t. opp. 30 (1955); Williamson in Wakefield *l.c.* 33 fig. 5 (1955); Ponder in Learmonth, *Vict. Nat.* 66: t. 4 opp. 130 (1949), as "*A. præmorsum*"; Wakefield, *Vict. Nat.* 57: 115 fig. 8 (1940), as "*A. præmorsum*"; Williamson, *Vict. Nat.* 43: 117 fig. 5 (1926), as "*A. præmorsum*"; Bailey, *Lithogr. Ferns Qd* 109 (1892), as "*A. furcatum*".

Vern.: Shredded Spleenwort (Forked Spleenwort). *Distr.*: Very localized in Victoria, where known only from a few shaded rocky situations in the south-west (basaltic caverns adjoining Darlot's Ck near Tyrendarra, Byaduk Caves, Victoria Range in western Grampians); S.A. (Mt. Gambier area and rare), W.A. (in karri forest, often as an epiphyte on *Casuarina decussata*), N.S.W., Qd, tropical and subtropical parts of all continents.

—Ultimate segments *close*, *elliptic-lanceolate*, indented (the lobes with *curved sides*), *membranous or slightly fleshy*, >1 cm. long; sori *short*; veins *obscure* (fronds to 4 ft. long, *proliferating by dorsal buds* toward tips of pinnæ; scales on stipe *entire, triangular*, tapering from a broad base, multiseptate):

61. *A. bulbiferum* Forst. f. *Flor. Ins. Aust. Prodr.* 80 (1786).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 33 fig. 1 (1955); Wakefield, *Vict. Nat.* 57: 115 fig. 4 (1940); Bond & Barrett, *Vict. Ferns* 15 (1934); Williamson, *Vict. Nat.* 43: 117 fig. 1 (1926); Dobbie, *N.Z. Ferns* ed. 4: 322, 346 (1951); Bailey, *Lithogr. Ferns Qd* 113 (1892).

Vern.: Mother Spleenwort. *Distr.*: Not uncommon in forest fern gullies of southern Victoria, from Lower Glenelg R. to the New South Wales border (e.g. Byaduk Caves, Grampians, Otways, Dandenongs, Upper Yarra R. watershed, Baw Baws, Wilson Prom., Mitchell R. gorge tract, Mt. Buck, near Bruthen, Mt. Ellery, Howe Ranges), also at King R. Falls in the north-east; S.A. (Mt. Gambier), ? W.A., Tas., N.S.W., Qd (south), Lord Howe Id, N.Z., Malaya, N. India, ? tropical Amer. [Naturally growing on banks, old logs or on trunks of ferns and trees, but widely cultivated in ferneries.]

—Ultimate segments *distant*, *linear*, *entire*, *thick* and slightly leathery, to 1 cm. long; sori *oblong*, 1 per pinnule, appearing almost marginal; veins *obscure* (fronds to 3 ft. long, flaccid, drooping, *not* proliferous; scales chiefly at extreme base of stipe, *narrow-linear* and, when present on rhachis, then with lateral branching at the attachment):

62. *A. flaccidum* Forst. f. *Flor. Ins. Aust. Prodr.* 80 (1786).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 33 fig. 2 (1955); Wakefield, *Vict. Nat.* 57: 115 fig. 3 (1940); Williamson, *Vict. Nat.* 43: 117 fig. 2 (1926);

Dobbie, *N.Z. Ferns* ed. 4: 354-356 (1951); Oliver, *J. Ecol.* 18: 28 fig. 9 (1930).

Vern.: Weeping Spleenwort. *Dist.*: Scattered through the wetter, cooler mountain-forests of southern Victoria, from the Otways east to the New South Wales border, growing either on mossy limbs or from crevices of damp rock-walls but much less frequent than *A. bulbiferum* (Mt. Disappointment, Dandenongs where very rare, Wilson Prom., Combienbar R., Euchre Ck, Mt. Drummer, Genoa Peak, Howe Ranges); Tas., N.S.W., Qd (south), Norfolk Id, N.Z. (common and variable).

[*A. hookerianum* Colenso in *Tasm. J. nat. Sci. Agric. Statist.* 2: 169 (1844), Maidenhair Spleenwort, is a small New Zealand fern that Ewart in *Flor. Vict.* 53 (1931) and others have admitted as Victorian—on the basis of a single collection in Melbourne Herbarium labelled "Upper Hume River, on rocks at 3-4000 ft.". This material (collected by F. v. Mueller in 1874) lacks the elongated sori and distinctly pedicellate pinnæ and pinnules typical of the plant in New Zealand, but shares the same type of very narrow-linear scale (as in *A. flaccidum*). It is most likely that Mueller's collection came from the slopes of Mt. Kosciusko, on the New South Wales side of the Murray River; therefore the species has been deleted from the body of this key.]

30. PLEUROSORUS Fée (?1853)

63. *P. rutifolius* (R. Br.) Fée *Mém. Fam. Foug.* 5: 179, t. 16c (?1853).

Grammitis rutæfolia R. Br. *Prodr. Flor. Nov. Holl.* 146 (1810).

Illust.: Fée (*l.c.*); Williamson in Wakefield, *Ferns Vict. Tasm.* 21 fig. 2 (1955); Green in Wakefield *l.c.* t. opp. 43 (1955); Williamson, *Vict. Nat.* 43: 58 fig. 2 (1926); Black, *Flor. S. Aust.* ed. 2: fig. 24 (1943); Dobbie, *N.Z. Ferns* ed. 4: 364 (1951); Rodway, *Tasm. Flor.* t. fig. 1 opp. 281 (1903), as "*Gymnogramme ruetæfolia*"; Bailey, *Lithogr. Ferns Qd* 173 (1892), as "*Grammitis rutæfolia*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 152 (1886), as "*Grammitis rutæfolia*".

Vern.: Blanket Fern. *Dist.*: Not uncommon in rock-crevices almost throughout Victoria, but not in the Mallee, Alps or wetter mountain-forests (frequent on basalt escarpments); all States (including tropical parts, where sparse and localized), Cent. Aust., N.Z.

Diagn.: Small, highly drought-resisting fern; rhizome very short, thick, with dark scales; fronds to 6" long, simply pinnate, deep green but wholly covered with soft, brownish, ± glandular, spreading hairs, the stipes with dark, narrow, denticulate scales toward base; pinnæ fan-shaped or obliquely obovate, 5-20 mm. long, their 2-4 large lobes very blunt and rounded; sori exindusiate, linear, in radiating lines lateral to the veins, often almost covering the whole under-surface.

[In *Vict. Nat.* 73: 169 (1957), M. D. Tindale made the new combination *Pleurosorus subglandulosus*, based on *Gymnogramma subglandulosa* Hook. & Grev. *Icon. Fil.* 1: t. 91 (1827); she expressed the opinion that this taxon, by virtue of its glandular-hairy population, is specifically distinct from *P. rutifolius* (a rather smaller fern with no gland-tipped hairs). Both entities are given a Victorian distribution, but the latter is considered to be less common and, apparently confined to the northern, drier parts of the State. The present writer believes that such a characteristic *per se*—even if constant—is too trifling to justify recognition of separate species. Microscopical examination of numerous specimens (from various parts of Victoria) has revealed instances in which both glandular and non-glandular hairs occur promiscuously on the same plant.]

Family 15. THELYPTERIDACEÆ

31. CYCLOSORUS Link (1833)

Rhachis *brown* (the stipe darker, stout and \pm succulent); pinnæ *shortening successively* toward base of frond where the lowest pairs are very short, their lobes obscurely *crenate*; sori *exindusiate*:

64. *C. pennigerus* (Forst. f.) Copeland in *Ann. cryptog. phytop.*, Waltham, Mass. 5: 143 (1947), atque *Gen. Fil.* 143 (1947).
Polypodium pennigerum Forst f. *Flor. Ins. Aust. Prodr.* 82 (1786).

Illust.: Willis in Wakefield, *Ferns Vict. Tasm.* 18 fig. 2 (1955); Willis, *Vict. Nat.* 60: 174 fig. 2 (1944), as "*Dryopteris pennigera*"; Dobbie, *N.Z. Ferns* ed. 4: 261 (1951).

Vern.: Lime Fern. *Distr.*: Restricted in Victoria to two very isolated centres in the south-west, and always on damp limestone or calcareous ground (western branch of Sherbrooke R. in West Otway region, Lower Glenelg R. gorge tract and its Moleside Ck tributary where locally abundant); Tas. (Mole Ck and Copper Ck near Smithton), N.Z., Chatham Is, ? Polynesia.

Rhachis *green*; pinnæ *only slightly shortened* toward frond-base, their lobes entire, sori protected by *reniform indusia*:

65. *C. parasiticus* (L.) Farwell in *Amer. Midl. Nat.* 12: 259 (1931).
Polypodium parasiticum L. *Spec. Plant.* 2: 1090 (1753);
Dryopteris dentata sens. Ewart *Flor. Vict.* 56 (1931), *non* (Forsk.) C. Chr. (1920).

Illust.: Willis in Wakefield, *Ferns Vict. Tasm.* 18 fig. 1 (1955); Willis, *Vict. Nat.* 60: 174 fig. 1 (1944), as "*Dryopteris nymphalis*"; Black, *Flor. S. Aust.* ed. 2: fig. 21, as "*Dryopteris parasitica*"; Williamson in Bond & Barrett, *Vict. Ferns* 33 fig. 2 (1934), as "*Dryopteris dentata*"; Williamson, *Vict. Nat.* 43: 150 fig. 2 (1926), as "*Dryopteris parasitica*"; Holttum, *Flor. Malaya* 2 (*Ferns*): fig. 162 (1954); Ogata, *Icon. Fil. japon.* 4: t. 174 (1931), as "*Dryopteris parasitica*".

Vern.: Binung (Soft Shield-fern). *Distr.*: Very localized and rare in Victoria, the only known occurrences being at Buchan (Dec. 1960) and Curdie's R. near Port Campbell Bay (1883) where probably now extinct; all States except Tas. (very rare in S.A.—on Murray R. cliffs near Blanche Town), extending to many tropical countries (viz. Indonesia, Malaya, Japan, Atlantic islands).

Family 16. ATHYRIACEÆ

Frond 12" long or more, *dark green*; sori *oblong or crescentic, lateral on lower part* of secondary veins; indusium *flat* (lowland or hill ferns) 32. *Athyrium*
 Frond up to 6" long, *pale green*, tender, fragile; sori *circular, terminal on upper branches of veins*; indusium at first covering sorus like a *pointed hood*, then lacerated and remaining attached only at base of sorus (rare fern of shaded rock-crevices in high mountain country) 33. *Cystopteris*

32. ATHYRIUM Roth in Roem. (1799)

Frond *twice or thrice pinnate*, to 5 ft. high, *very broad*; ultimate pinnales *prominently toothed*:

66. *A. australe* C. Presl *Tent. Pterid.* 98 (1836).

A. umbrosum sens. Ewart *Flor. Vict.* 47 (1931), atque auctt. plur., non (Ait.) C. Presl (1836).

Illust.: Wakefield, *Ferns Vict. Tasm.* 29 fig. 2 (1955); Wakefield, *Vict. Nat.* 58: 141 fig. 3 (1942), as "*Diplasium australe*"; Williamson in Bond & Barrett, *Vict. Ferns* 47 fig. 1 (1934), as "*A. umbrosum*"; Williamson, *Vict. Nat.* 43: 148 fig. 1 (1926), as "*A. umbrosum*"; Dobbie, *N.Z. Ferns* ed. 4: 271 (1951); Bailey, *Lithogr. Ferns Qd* 114-115 (1892), as "*Asplenium umbrosum*".

Vern.: Austral Lady-fern (Shade Spleenwort). *Distr.*: Occasional in southern and eastern Victoria, inhabiting the shadiest and dampest parts of mountain fern gullies and jungle-flats (Otways, Dandenongs, Wilson Prom., Mitchell R. gorge tract, Brodribb R., Upper Combienbar R., Murrindal R. etc.); Tas. (north-west), N.S.W., Qd, N.Z.

Frond *once pinnate* (or the lower pinnae deeply cut into secondary lobes), <2 ft. long, rather *narrow*; ultimate lobes very *obscurely toothed* (rare fern of East Gippsland):

67. *A. japonicum* (Thunb.) Copeland in *Philipp. J. Sci. (Bot.)* 3: 290 (1908).

Asplenium japonicum Thunb. *Flor. japon.* 334 (1784).

Illust.: Wakefield, *Ferns Vict. Tasm.* 29 fig. 1 (1955); Wakefield, *Vict. Nat.* 58: 141 fig. 1-2 (1942), as "*Diplasium japonicum*"; Dobbie, *N.Z. Ferns* ed. 4: 273 (1951); Bailey, *Lithogr. Ferns Qd* 117 (1892), as "*Asplenium japonicum*"; Ogata, *Icon. Fil. japon.* 3: t. 115 (1930), as "*Diplazium japonicum*"; Makino, *Ill. Flor. Jap.* 1224 (1924), as "*Diplazium japonicum*".

Vern.: Japanese Lady-fern. *Distr.*: Extremely localized in Victoria, where known from only three localities in East Gippsland, viz. alluvial jungle-flats on the Upper Combienbar R. (1941) and Brodribb R. (1941)—but now destroyed through clearing operations in the latter habitat—also at Buchan (Dec. 1960); N.S.W., Qd, N.Z. (extremely rare, at northern end of North Id), Kermadec Is, Polynesia, Japan, China, Malaya, India.

33. CYSTOPTERIS Bernh. in Schrad. (1806)

68. *C. filix-fragilis* (L.) Bernh. in Schrad. *Neues J. Bot.* 1²: 26, t. 2 fig. 9 (1806).

Polypodium filix-fragile L. *Spec. Plant.* 2: 1091 (1753);

C. "fragilis" in Ewart *Flor. Vict.* 37 (1931), atque auctt. plur.

Illust.: Wakefield, *Ferns Vict. Tasm.* 29 fig. 3 (1955), *l.c.* t. opp. 31 (1955); Williamson, *Vict. Nat.* 43: 148 fig. 5 (1926); Fitch in Hooker f., *Flor. Tasm.* 2: t. 166, col. (1859); Dobbie, *N.Z. Ferns* ed. 4: 269 (1951)—all as "*C. fragilis*". [Illustrations of the typical, boreal form, although numerous, are deliberately omitted.]

Vern.: Brittle Bladder-fern. *Distr.*: Localized and rare in Victoria, where known only from wet shaded rock-crevices in the alps and subalps (Mt. Buller, Wotan Ck on Mt. Bogong, Upper Buchan R., Little R. Falls near Wulgulmerang); similar situations in Tas., N.S.W. and N.Z. highlands, otherwise almost cosmopolitan—Clapham, Tutin & Warburg in *Flor. Brit. Isles* 33 (1952) describe it as "the most widespread of all ferns, extending from 81° 47' N. in Greenland to Kerguelen."

Diagn.: Rhizome rather short, bearing thin brown fragile scales; stipes tufted, pale, slender, smooth; frond variable, 1-12" long, always delicate, membranous and brittle, rather distantly once pinnate; pinnae to 1" long, usually opposite, the lower deeply dissected into relatively large and bluntly toothed lobes; sori

small, isolated, terminating the upper branches of veins but not marginal; indusium a whitish, membranous, pointed, hood-like "bladder", exceeding the sorus, finally torn and attached only near base of sorus; spores acutely tuberculate.

[The south-east Australian (and New Zealand) form of the species differs from the typical, European condition in having narrower, more delicate fronds and rather less dissected, relatively broader pinnæ. Specimens of this population from the Kosciusko alpine region, N.S.W., were described as a distinct species, *Woodsia lætevirens*, by C. Prentice in *Bull. Qd Dep. Agric.* 7: 37 (1891); but C. Christensen *Index Fil.* 657 (1906), reduced it to "*Cystopteris fragilis* var.".]

Family 17. ASPIDIACEÆ

1. Stipe either bristly or devoid of scales (except at very base); upper surface of main rhachis bearing 2 prominent ridges, each of which is continuous with the thickened leaf-edge; segments acutely toothed; indusium reniform to circular, attached laterally 36. *Lastreopsis*
Stipe (and often rhachises) beset with papery brown scales; ridges (if present) on upper surface of main rhachis never continuous with leaf-edge; indusia large, always round, peltate 2
2. Rhizome long-creeping, often epiphytic; fronds thick and leathery; basal pinnæ much longer than others; teeth of pinnules very obtuse; costæ prominently raised 34. *Rumohra*
Rhizome stout, erect, terrestrial; fronds tufted, not leathery; basal pinnæ hardly longer than others; toothings acute or subacute; costæ not or scarcely raised 35. *Polystichum*

34. RUMOHRA Raddi (1819)

69. *R. adiantiformis* (Forst. f.) Ching in *Sinensia* 5: 70 (1934).

Polypodium adiantiforme Forst. f. *Flor. Ins. Aust. Prodr.* 82 (1786);
Polystichum adiantiforme (Forst. f.) J. Sm. *Hist. Fil.* 220 (1875).

Illust.: Wakefield, *Ferns Vict. Tasm.* 41 fig. 1 (1955); Williamson in Bond & Barrett, *Vict. Ferns* 47 fig. 3 (1934), as "*Polystichum adiantiforme*"; Williamson, *Vict. Nat.* 43: 148 fig. 3 (1926), as "*Polystichum adiantiforme*"; Goy, *Qd Nat.* 10: t. 10 (1938), as "*Polystichum adiantiforme*"; Dobbie, *N.Z. Ferns* ed. 4: 245 (1951); Mueller, *Key Syst. Vict. Plant.* 2: fig. 150 (1886), as "*Aspidium capense*"; Benedict, *J. N.Y. bot. Gdn.* 29: 47 (1928), as "*Polystichum adiantiforme*"; Valentin & Cotton, *Ill. Flowering Plant. & Ferns Falkland Is.* t. 60 (1921), as "*Polystichum adiantiforme*".

Vern.: Leathery Shield-fern (Shield Hare's-foot). *Distr.*: Frequent in the shaded mountain fern gullies of Victoria, from the Grampians and Mt. Macedon to the New South Wales border, usually epiphytic on tree-ferns (chiefly *Dicksonia*) but sometimes rupestral on mossy cliff-faces (e.g. Otways, Dandenongs, Kinglake hills, Upper Yarra forests, Strzelecki Range, Wilson Prom., Mt. Ellery, Mt. Kaye, Genoa Peak, Upper West Kiewa R. etc.); Tas., N.S.W., Qd (south-east and rare), N.Z., Polynesia, S. Amer., S. Afr., Mascarene Is, Tristan da Cunha.

Diagn.: Rhizome stout, long-creeping, densely beset with large reddish-brown scales; fronds deltoid, shining, leathery, up to 3 ft. long (but usually ± 1 ft.), on relatively long stipes, 2- to 3-times pinnate, the main rhachises with scattered

papery scales and minor ones winged; pinnules glabrous, narrow-lanceolate, 1-2 cm. long, bluntly toothed; sori circular, 1-2 mm. wide, 1 per lobe, abundant and conspicuous; indusium peltate, pale, contrasting with the dark-coloured emerging sporangia.

35. POLYSTICHUM Roth in Roem. (1799)

Frond *narrowly triangular or linear* in outline, the rhachis with 1 or more *proliferous buds* or bulbils toward apex; scales of rhizome and stipe tough, *shiny, dark brown* to blackish, usually with pale margins; lobes of pinnules *subacute* or some even obtuse (widespread fern often developing a trunk to 1 ft. high):

70. *P. proliferum* (R. Br.) C. Presl *Tent. Pterid.* 83 (1836).

Aspidium proliferum R. Br. *Prodr. Flor. Nov. Holl.* 147 (1810);

P. aculeatum sens. Ewart *Flor. Vict.* 55 (1931), atque auctt. Aust. plur., *non* (L.) Schott (1834).

Illust.: Wakefield, *Ferns Vict. Tasm.* 48 fig. 1 (1955); Black, *Flor. S. Aust.* ed. 2: fig. 20 (1943); Ewart, *Flor. Vict.* fig. 17 (1931); Griffiths, *Wild Life* 6: 202 (1944); Williamson in Bond & Barrett, *Vict. Ferns* 47 fig. 2 (1934); Williamson, *Vict. Nat.* 43: 148 fig. 2 (1926)—all, except Wakefield, as "*P. aculeatum*".

Vern.: Mother Shield-fern (Common Shield-fern). *Distr.*: Widespread throughout the cool, shaded forest land of Victoria, from the Lower Glenelg R. and Grampians to the border of New South Wales, ascending into subalpine woodland of the north-eastern Alps where often abundant over acres of country (e.g. Pyrenees, Otways, Mt. Macedon, Dandenongs, Baw Baws Wilson Prom., Mts. Buller & Buffalo, Barry Mts., Bogongs, Mitchell R. gorge tract, Mt. Ellery, Mt. Kaye, Upper Genoa R. etc.); S.A., Tas., N.S.W., Qd (south-east).

[The name *P. aculeatum* (L.) Schott has been universally applied, in a broad sense, to populations of every continent (including Australia); but it is now reserved for a European fern with *non-proliferous* fronds, sharply toothed segments and pallid brown, unbordered scales.]

Frond *broadly triangular to fusiform* (the central pinnæ being longest), *without* any proliferous buds; scales all *papery*, rather *dull, brown* and borderless; lobes of pinnules all *sharply acute* to aristate and prickly (trunkless fern of East Gippsland):

71. *P. formosum* M. D. Tindale in *S. Aust. Nat.* 28: 32 (1954).

Illust.: Wakefield, *Ferns Vict. Tasm.* 48 fig. 2 (1955); Goy, *Qd Nat.* 10: t. 8 opp. 72 (1938), as "*P. aculeatum*"; Bailey, *Lithogr. Ferns Qd* 135 (1892), as "*Aspidium aculeatum*".

Vern.: Broad Shield-fern. *Distr.*: Scattered in shaded rocky places near water in East Gippsland, Vic. (Deadcock Ck near Mitchell R. gorge, W Tree Ck near Gelantipy, Murrindal R. near Buchan, Yambulla Ck near Upper Genoa R.); N.S.W., Qd (south-east).

36. LASTREOPSIS Ching (1938)

1. Stipe and main rhachises beset throughout with *dark brown, spreading bristles* to 5 mm. long; ultimate pinnules about 2 mm. wide, deeply

incised, with sharp acuminate teeth (handsome lacy fern with finely dissected, lustrous, deltoid fronds 6-18" long; rhizomes long-creeping, thickish with numerous red-brown scales):

72. *L. hispida* (Swartz) M. D. Tindale in *Vict. Nat.* 73: 183 (1957).

Aspidium hispidum Swartz in Schrad. *J. Bot.*, Göttingen 1800²: 39 (1801);

Polystichum hispidum (Swartz) J. Sm. in *J. Bot.*, Lond. 4: 195 (1842).

Illust.: Wakefield, *Ferns Vict. Tasm.* 48 fig. 3 (1955); Williamson in Bond & Barrett, *Vict. Ferns* 47 fig. 4 (1934); Williamson, *Vict. Nat.* 43: 148 fig. 4 (1926)—all as "*Polystichum hispidum*"; Dobbie, *N.Z. Ferns* ed. 4: 249 (1951), as "*Rumohra hispida*".

Vern.: Bristly Shield-fern (Hairy Shield-fern). *Distr.*: Confined in Victoria to very shaded mountain fern gullies with abundant moisture, and uncommon, growing both on wet gravelly soil and on mossy trunks or decayed logs usually under *Nothofagus* groves (Otways, Dandenongs where rare, Upper Yarra R. near Healesville, sources of Bunyip R. near Beenak, but apparently not in East Gippsland); Tas. (south and west), N.S.W. (south-east), N.Z. (frequent throughout from sea-level to 2000 ft., often covering the ground), Chatham Is.

—Stipe \pm pubescent, but without bristles; ultimate pinnules with shallow and obtuse or broadly acute teeth 2

2. Pinnules greyish-green, rather dull, finely pubescent all over, deeply incised, with numerous minute sori; frond deltoid; rhizome shortly creeping (rare fern of extreme south-east of East Gippsland):

73. *L. decomposita* (R. Br.) M. D. Tindale in *Vict. Nat.* 73: 183 (1957).

Nephrodium decompositum R. Br. *Prodr. Flor. Nov. Holl.* 149 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 47 fig. 1 (1955), as "*Ctenitis decomposita*"; Wakefield, *Vict. Nat.* 60: 156 fig. 1 (1944), as "*Dryopteris decomposita*"; Bailey, *Lithogr. Ferns Qd* 137 (1892), as "*Aspidium decompositum*".

Vern.: Trim Shield-fern. *Distr.*: Extremely localized in Victoria, where known only from a gully flat on Mallacoota Inlet (opposite Gipsy Point) in far south-east of Gippsland (1941); N.S.W., Qd (south-east).

—Pinnules bright green, shiny, glabrous (except on under-side of mid-veins), with shallow incisions and large sori 3

3. Rhizome 2-5 mm. thick, long-creeping; frond broadly deltoid; ultimate pinnules acutely toothed (East Gippsland fern):

74. *L. microsora* (Endl.) M. D. Tindale in *Vict. Nat.* 73: 181 (1957).

Nephrodium microsorum Endl. *Prodr. Flor. Norfolk.* 9 (1833);

Dryopteris tenera sens. auctt. Aust. plur., non (R. Br.) C. Chr. (1905).

Illust.: Wakefield, *Ferns Vict. Tasm.* 47 fig. 2 (1955), as "*Ctenitis tenera*"; Wakefield, *Vict. Nat.* 60: 156 fig. 2 (1944), as "*Dryopteris tenera*"; ? Dobbie, *N.Z. Ferns* ed. 4: 251 (1951), as "*Ctenitis decomposita*".

Vern.: Creeping Shield-fern. *Distr.*: Confined in Victoria to far East Gippsland, but locally abundant on shaded floors of jungle patches at Mt. Drummer, Karlo Ck, Mallacoota Inlet and Howe Ranges; N.S.W., Qd, N.Z.

—Rhizome *tufted*, suberect; *frond* narrowly triangular, very lustrous; ultimate pinnules *bluntly and obscurely toothed* (widespread fern):

75. *L. shepherdii* (Kunze ex Mett.) M. D. Tindale in *Vict. Nat.* 73: 182 (1957).
Aspidium shepherdii Kunze ex Mett. *Fil. Lips.* 94 (1856);
Dryopteris decomposita sens. Ewart *Flor. Vict.* 56 (1931), atque auctt.
 al., *non* (R. Br.) O. Kuntze (1891).

Illust.: Wakefield, *Ferns Vict. Tasm.* 47 fig. 3 (1955), as "*Ctenitis shepherdii*"; Wakefield, *Vict. Nat.* 60: 156 fig. 3 (1944), as "*Dryopteris shepherdii*"; Howie in Bond & Barrett, *Vict. Ferns* t. opp. 17, col. (1934), as "*Dryopteris decomposita*"; Williamson in Bond & Barrett *l.c.* 33 fig. 1 (1934), as "*D. decomposita*"; Williamson, *Vict. Nat.* 43: 148 fig. 1 (1926), as "*D. decomposita*".

Vern.: Shiny Shield-fern. *Distr.*: Not uncommon in southern Victoria, where inhabiting damp shaded mountain gullies, eastern jungle-flats and western caves (also mine-shafts), e.g. Byaduk and Tyrendarra Caves, Lower Glenelg R., Creswick (in shafts), Otways, Dandenongs, Kinglake, Warburton hills, Main Ck near Cape Schanck, Walhalla, Wilson Prom., Strzelecki Range, Upper Jamieson R., and many parts of East Gippsland to the Howe Ranges; S.A. (Yallum Caves and rare), Tas., N.S.W., Qd (south-east, rare).

[The New Zealand and Polynesian species *L. glabella* (A. Cunn.) M. D. Tindale (*l.c.* 183) is recorded for southern Victoria in Ewart's *Flor. Vict.* 57 (1931), under the name *Dryopteris glabella* (A. Cunn.) C. Chr.; but the record is based upon an erroneous identification of *Lastreopsis shepherdii*, and it should be deleted.]

Family 18. BLECHNACEÆ

- Sori in 2 continuous bands throughout the length of each fertile pinna;
 secondary veins parallel, *not anastomosing* 37. *Blechnum*
 Sori oblong, in one or more interrupted lines on each side of mid-vein;
 secondary veins of each pinna netted, anastomosing freely 38. *Doodia*

37. BLECHNUM L. (1753)

1. Barren and fertile fronds similar, 1-3 ft. long, of \pm leathery texture, yellowish-green, the margins finely serrate; continuous sorus close to, and on each side of, mid-vein but *never extending to the margins* of fertile pinnæ which are broadly attached (the longest 2-6"):

76. *B. cartilagineum* Swartz *Synops. Fil.* 114, 312 (1806).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 36 fig. 1 (1955); Nicholls in Wakefield *l.c.* t. opp. 39 (1955); Williamson, *Vict. Nat.* 43: 88 fig. 1 (1926); Bailey, *Lithogr. Ferns Qd* 88-89 (1892); Mueller, *Key Syst. Vict. Plant.* 2: fig. 147 (1886).

Vern.: Gristle Fern. *Distr.*: Frequent in fern gullies and more open mountain-forests of Victoria (often in association with *Cyathea australis*) from the Otways and Mt. Macedon to the New South Wales border (e.g. Kinglake, Dandenongs, slopes of Baw Baws, Wilson Prom., Bruthen area, Mt. Ellery, Mt. Kaye, Bendoe, Genoa Peak, Howe Ranges etc.); Tas. (north and east), N.S.W., Qd, ? Philippines.

—Barren and fertile pinnae manifestly dissimilar; sori of the latter extending to the margins which are revolute (giving each fertile pinna a much-contracted, narrow-linear appearance) 2

2. Fronds dark green, to 1" broad, seldom much >1 ft. long, all or some being undivided and strap-like (whenever lobing occurs, the segments very few and irregular):

77. *B. patersonii* (R. Br.) Mett. *Fil. Lips.* 64, t. 4 fig. 4-10 (1856).

Stegania patersonii R. Br. *Prodr. Flor. Nov. Holl.* 152 (1810).

Illust.: Mettenius (*l.c.*); Williamson in Wakefield, *Ferns Vict. Tasm.* 36 fig. 2 (1955); Williamson, *Vict. Nat.* 43: 88 fig. 2 (1926); Bailey, *Lithogr. Ferns Qd* 82 (1892), as "*Lomaria patersonii*".

Vern.: Strap Water-fern (Strap Fern). *Distr.*: Shaded banks of streams in mountain-forest and wetter parts of Victorian fern gullies, sometimes amongst boulders or lining old mine-shafts, but not common (e.g. Creswick, Otways, Dandenongs, Warburton district, Strzelecki Range, Wilson Prom., Pipeclay Ck near Orbost, Mt. Ellery, Cann R., Howe Ranges); Tas., N.S.W., Qd, ? Indonesia, ? Philippines.

[The New Zealand fern referred to *B. patersonii* is a pinnate species of very different aspect; its correct name is *B. colensoi* (Hook. f.) N.A. Wakefield in *Vict. Nat.* 72: 159 (1956).]

—Fronds all regularly pinnate, with numerous pinnae 3

3. Longest segment of barren frond 2 cm. long or less, oblong to subrotund, regularly perpendicular to rhachis 7
Longest segment much >2 cm. long, narrow-oblong to linear-lanceolate, or, if ever about 2 cm., then pinnae curved and inclined to rhachis 4
4. Pinnae attached to rhachis by their mid-veins only; rhachis \pm scaly (fronds often 5 ft. long or more) 6
Pinnae sessile, attached by their full breadth; rhachis glabrous, except at extreme base (fronds rarely >3 ft. long) 5
5. Stipe black, shiny; barren pinnae entire (or, with luxuriant growth, some fronds may become irregularly bipinnate), yellowish-green, straight, almost perpendicular to rhachis, the lowermost reduced segments becoming isolated (old plants often developing short, upright trunks):

78. *B. nudum* (Labill.) Mett. ex Luerss. *Verst. heimatl. Flor.* 292 (1876).

Onoclea nuda Labill. *Nov. Holl. Plant. Specim.* 2: 96, t. 246 (1807);

B. discolor sens. Ewart *Flor. Vict.* 51 (1931), atque auctt. plur., non (Forst. f.) Keys (1873).

Illust.: Labillardière (*l.c.*); Williamson in Wakefield, *Ferns Vict. Tasm.* 36 fig. 3 (1955); Nicholls in Wakefield *l.c.* t. opp. 38 (1955); Williamson, *Vict. Nat.* 43: 88 fig. 3 (1926), as "*B. discolor*"; Griffiths, *Wild Life* 6: 205 (1944), as "*B. discolor*"; Ewart, *Flor. Vict.* fig. 15 (1931), as "*B. discolor*"; Bailey, *Lithogr. Ferns Qd* 83-84 (1892), as "*Lomaria discolor*".

Vern.: Fishbone Water-fern (Fishbone Fern). *Distr.*: Along shaded water-courses and moist forest slopes almost throughout Victoria, except the lower rainfall areas of the north and north-west (e.g. Lower Glenelg R. where abundant, Grampians, Byaduk Caves, Pyrenees, Otways, Mt. Macedon, Dandenongs,

Wilson Prom., Strzelecki Range, Upper Jamieson R., Barry Mts., and many parts of East Gippsland to the Howe Ranges); all States except W.A., Norfolk Id (but apparently not in N.Z.), ? S. Afr. (whence recorded by E. A. C. L. E. Schelpe in 1952).

[The unusual, luxuriant, bipinnate condition has been noted at Arthur's Seat, in the Dandenong and Macedon Ranges, and it responds to cultivation. In New South Wales the name "Fishbone Fern" is applied to *Nephrolepis cordifolia*.]

- Stipe neither black *nor* shiny; barren pinnæ *denticulate* toward apex, very prominently veined, regularly *curved upwards*, the lowermost reduced segments extremely *broad and close together* (forming an interrupted basal wing to the stipe):

79. *B. aggregatum* (Colenso) M. D. Tindale in *Proc. Linn. Soc. N.S.W.* 85: 254 (1960).

Lomaria aggregata Colenso in *Trans. N.Z. Inst.* 20: 223 (1888);

B. lanceolatum (R. Br., ut *Stegania* sp., 1810) Sturm f. *Enum. Plant. vasc. crypt. Chil.* 25 (1858), *non* Raddi (1819).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 36 fig. 4 (1955); Nicholls in Wakefield l.c. t. opp. 39 (1955); Williamson, *Vict. Nat.* 43: 88 fig. 4 (1926); Griffiths, *Wild Life* 6: 205 (1944); Dobbie, *N.Z. Ferns* ed. 4: 287 (1951); Bailey, *Lithogr. Ferns Qd* 85 (1892), as "*Lomaria lanceolata*"; Bower, *The Ferns* 3: 168 (1928)—all except Bailey (1892) as "*B. lanceolatum*".

Vern.: Lance Water-fern (Lance Fern). *Distr.*: Not uncommon adjacent to streams and waterfalls in the shadier parts of Victorian fern gullies (e.g. Lower Glenelg R., Otways, Mt. Macedon, Dandenongs, Main Ck near Mt. Schanck, Strzelecki Range, Wilson Prom., Bindi, Mt. Ellery, Combienbar, Arte R., etc.); Tas., N.S.W., Qd (south), N.Z., Polynesia, ? Chile.

6. Frond rigidly *coriaceous*, *dark green*; lower pinnæ *not* much reduced in length, ending abruptly on stipe; barren segments with *boldly engraved venation*, sometimes 25 mm. broad (the fertile ones 3-5 mm. wide):

80. *B. procerum* (Forst. f.) Swartz in Schrad. *J. Bot., Göttingen* 1800²: 75 (1801).

Osmunda procera Forst. f. *Flor. Ins. Aust. Prodr.* 78 (1786);

B. capense sens. Ewart *Flor. Vict.* 51 (1931) *pro parte, non* (L.) Schlechtendal (1825).

Illust.: Tindale, *Proc. Linn. Soc. N.S.W.* 85: t. 7 (1960), as "*Osmunda procera*"; Williamson in Wakefield, *Ferns Vict. Tasm.* 36 fig. 7 (1955); Nicholls in Wakefield l.c. t. opp. 38 (1955); Williamson, *Vict. Nat.* 43: 88 fig. 7 (1926), as "*B. capense*"; Griffiths, *Wild Life* 6: 205 (1944); Dobbie, *N.Z. Ferns* ed. 4: 297, 299, 301 (1951); Dobbie l.c. 285 (1951), as "*B. minor*"; Bailey, *Lithogr. Ferns Qd* 86 (1892), as "*Lomaria capensis*".

Vern.: Hard Water-fern (Hard Hill-fern, Red Cabbage Fern, "Kio Kio"—Maori name). *Distr.*: Frequent in mountain fern gullies of Victoria, from the Lower Glenelg R. to the New South Wales border, preferring muddy flats where colonies may extend over acres of ground (e.g. in Grampians, Otways, Mt. Macedon, Dandenongs, Baw Baws, Wilson Prom., Mt. Buffalo, Barry Mts.,

Mt. Ellery, Genoa R., Howe Ranges); Tas., N.S.W., Qd, N.Z., Polynesia, Borneo (high mountains).

—Fronde *membranous to subcoriaceous*, often pallid; pinnæ *gradually diminishing* toward stipe, the lowermost quite *isolated and subrotund*; barren segments *not* boldly veined, rarely > 15 mm. broad (the fertile only about 2 mm. wide):

81. *B. minus* (R. Br.) Ettingsh. in *Denkschr. Akad. Wiss., Wien* 23: 63, t. 8 fig. 5 & 12 (1864).

Stegania minor R. Br. *Prodr. Flor. Nov. Holl.* 153 (1810):

B. capense sens. Ewart *Flor. Vict.* 51 (1931) pro parte, atque auctt. plur., *non* (L.) Schlechtendal (1825).

Illust.: Ettingshausen (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 35 fig. 2 (1955); Bond & Barrett in Wakefield *l.c.* 38 (1955); Black, *Flor. S. Aust.* ed. 2: fig. 18 (1943), as "*B. capense*"; Dobbie, *N.Z. Ferns* ed. 2: 197, 199 (1921), as "*Lomaria capensis*".

Vern.: Soft Water-fern. *Distr.*: Along many Victorian lowland streams and common in damp places generally throughout the highlands, extending from the South Australian to New South Wales border, but tolerating more open situations than *B. procerum*; Tas., S.A. (south-east), N.S.W., N.Z.

[Although the name *B. capense* has been widely used for Australasian populations, these are not conspecific with the plant originally described from South Africa; the latter lacks the progressively shorter pinnæ toward the base of rhachis, and in this feature approaches *B. procerum*. Two distinct species are widespread in south-eastern Australia; but there is still some uncertainty as to whether the two names *B. procerum* and *B. minus* are being correctly applied to these—only a critical examination of the types of both can resolve this doubt.]

7. Rhizome *short and stout*, with *radiating fronds* > 1 ft. long; rhachises beset with narrow-lanceolate brown scales and *short glandular hairs*; lower barren pinnæ attached to rhachis *by the mid-vein only*:

82. *B. fluviatile* (R. Br.) E. J. Lowe ex Salomon *Nom. Gefässkrypt.* 115 (1883).
Stegania fluviatilis R. Br. *Prodr. Flor. Nov. Holl.* 152 (1810).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 36 fig. 6 (1955); Williamson, *Vict. Nat.* 43: 88 fig. 6 (1926); Dobbie, *N.Z. Ferns* ed. 4: 305 (1951); Fitch in Hooker f., *Flor. Tasm.* 2: t. 167, col. (1859), as "*Lomaria fluviatilis*".

Vern.: Ray Water-fern. *Distr.*: Moist, but well-drained, shady recesses of Victorian fern gullies, from the Otways and Mt. Macedon to New South Wales border, not uncommon and often ascending to the alps (e.g. Kinglake, Dandenongs, Baw Baws, Wilson Prom., Bindi, Murrungowar, Combienbar, Mt. Ellery, Upper Delegate R., Mt. Feathertop, Mitta Mitta, Barry Mts.); Tas., N.S.W., N.Z., Chatham Is., ? Borneo (high mountains).

—Rhizome *long-creeping*, with *scattered fronds* rarely 1 ft. long; rhachises with a few scattered scales, but *not* glandular-hairy; all pinnæ attached *by their full breadth* (alpine and subalpine fern):

83. *B. penna-marina* (Poir.) Kuhn *Fil. afr.* 92 (1868).

Polypodium penna-marina Poir. in *Encycl. méth. (Bot.)* 5: 520 (1804).

Illust.: Laird in Taylor, *Rep. Aust. Nat. Antarct. Res. Exped.*, ser. B, 2 (Bot.): 153 (1955); Williamson in Wakefield, *Ferns Vict. Tasm.* 36 fig. 5 (1955); Williamson, *Vict. Nat.* 43: 88 fig. 5 (1926); Dobbie, *N.Z. Ferns* ed. 4: 279 (1951); Mueller, *Key Syst. Vict. Plant.* 2: fig. 146 (1886), as "*Lomaria alpina*"; Vallengin & Cotton, *Ill. Flowering Plant. & Ferns Falkland Is.* t. 62 (1921).

Vern.: Alpine Water-fern (Alpine Fern). *Distr.*: Abundant throughout the Alps in Victoria, occurring along water-courses through the heath, alpine herbfield, subalpine woodland and even forest formations, and occasionally descending to altitudes as low as 3000 ft. (e.g. Lake Mtn., Baw Baws, Mt. Skene, Mt. Buller, Mt. Buffalo, Barry Mts., Bogong & Dargo High Plains, Nunniong Plateau, Cobboras, Bidwell near Bendoc); Tas., N.S.W. (south-east), N.Z., subantarctic islands, temperate S. Amer.

[*B. filiforme* (A. Cunn. in Hook., ut *Lomaria* sp.) Ettingsh. (1864) is a New Zealand and Polynesian species, remarkable for its climbing habit and *dimorphic* barren fronds (those on the ground having very short pinnæ 5-25 mm. long). More than 80 years ago Chas. French collected terrestrial barren fronds of this fern at "Cheltenham Springs"—now part of a golf-links. In February 1905, B. P. G. Hochreutiner (of Geneva) visited Healesville and collected ferns which were later identified by H. Christ, *B. filiforme* being among the species recorded. The plant has never been rediscovered there (or elsewhere in Victoria) since, and it is possible either that a misdetermination was made or that Hochreutiner wrongly labelled some specimen he had actually gathered in New Zealand. With such uncertainty as to any present Australian occurrence, the species has not been included in this key.]

38. DOODIA R. Br. (1810)

1. Rhachis *smooth* or with a few, small, *hair-like, contorted scales*; pinnæ attached by the mid-vein only (except in upper third of frond which is 6-12" long); sori *linear*, close together and often confluent:

84. *D. caudata* (Cav.) R. Br. *Prodr. Flor. Nov. Holl.* 151 (1810).

Woodwardia caudata Cav. *Descr. Plant.* 264 (1802).

Illust.: Wakefield, *Ferns Vict. Tasm.* 40 fig. 3 (1955); Wakefield, *Vict. Nat.* 56: 170 fig. 3 (1940); Goy, *Qd Nat.* 11: t. inter 22 & 23 (1939); Williamson in Bond & Barrett, *Vict. Ferns* 33 fig. 4 (1934); Williamson, *Vict. Nat.* 43: 150 fig. 4 (1926); Dobbie, *N.Z. Ferns* ed. 4: 315 (1951); Bailey, *Lithogr. Ferns Qd* 96 (1892), as "*D. aspera* var. *caudata*"; Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 125 fig. 23 (1915).

Vern.: Small Rasp-fern. *Distr.*: Not uncommon in southern Victoria, favouring wet shaded places along streams or rock-crevices (e.g. Wannon Falls near Hamilton, Otways, Main Ck near Cape Schanck, Cardinia Ck, Strzelecki Range, Bruthen, Nowa Nowa, Buchan, Snowy R., Combienbar, Genoa); Tas., N.S.W., Qd, N. Cal., N.Z. (localized in North Id).

[Victorian material is all referable to the var. *dimorpha* Domin in *Bibl. bot., Stuttgart* 20 (Heft 85): 124 (1915); it differs from the typical, Port Jackson form in having fertile fronds about *twice the length* of the barren ones, and also has longer, comparatively narrower pinnæ.]

- Rhachis \pm *tuberculate* and bearing few or many *broad blackish scales*; at least half of the pinnæ attached by their full breadth; sori *short and manifestly separated*

2. Lowermost few pinnæ attached by the mid-vein only; stipe sparingly scaly, with \pm scattered tubercles:

85. *D. media* R. Br. *Prodr. Flor. Nov. Holl.* 151 (1810).

D. aspera sens. Ewart *Flor. Vict.* 48 (1931) pro parte, non strict. R. Br. (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 40 fig. 1, 4-5 (1955); Wakefield, *Vict. Nat.* 56: 170 fig. 4-5 (1940); Goy, *Qd Nat.* 11: t. opp. 23 (1939); Howie in Tadgell, *Vict. Nat.* 51: t. 17, col. (1934), as "*D. caudata*"; Howie in Bond & Barrett, *Vict. Ferns*: frontispiece, col. (1934), as "*D. caudata*"; Dobbie, *N.Z. Ferns* ed. 4: 199, 311 (1951); Bailey, *Lithogr. Ferns Qd* 95 (1892), as "*D. aspera* var. *media*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 148 (1886), as "*Woodsia caudata*"; Bower, *The Ferns* 3: 183 (1928).

Vern.: Common Rasp-fern. *Distr.*: Frequent in damp forests and along shaded stream-banks of Victoria, often in rather exposed rocky places (e.g. Hopkins R., Dandenongs, Otways, Walhalla, Upper Jamieson R., Beechworth hills, Wilson Prom., Lakes Entrance, Genoa R.); Tas., N.S.W., Qd, Norfolk Id, N.Z. (abundant), Polynesia (as far north-east as Hawaii).

—All pinnæ (except rarely the lowest pair) attached by their full breadth; stipe clothed with scales, roughened with numerous sharp tubercles:

86. *D. aspera* R. Br. *Prodr. Flor. Nov. Holl.* 151 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 40 fig. 2 (1955); Wakefield, *Vict. Nat.* 56: 168 fig. 2 (1940); Williamson in Bond & Barrett, *Vict. Ferns* 33 fig. 5 (1934); Williamson, *Vict. Nat.* 43: 150 fig. 5 (1926); Bailey, *Lithogr. Ferns Qd* 93 (1892).

Vern.: Prickly Rasp-fern. *Distr.*: In Victoria confined to shaded jungle-patches of East Gippsland (Glen Arte, Combienbar, Cann R., Mt. Drummer, Upper Genoa R., Mallacoota Inlet, Howe Ranges), but abundant in these areas and with an outlying occurrence on limestone at Buchan; N.S.W., Qd.

Family 19. MARSILEACEÆ

Sterile fronds grass-like, filiform

39. *Pilularia*

Sterile fronds clover-like, with 4 cruciform "leaflets"

40. *Marsilea*

39. PILULARIA L. (1753)

87. *P. novæ-hollandiæ* A. Br. in *Mber. Akad. Wiss., Berl.* 1863: 435 (1864).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 57 fig. 4 (1955); Williamson, *Vict. Nat.* 42: 265 fig. 4 (1926); Goebel, *Organogr. Plant.* Engl. ed., 2: fig. 330 (1905).

Vern.: Austral Pillwort. *Distr.*: Occasional in western and northern Victoria, growing amongst grass and small sedges on the drying mud of waterholes, lagoons and swamps, but probably overlooked (Wimmera at Serviceton etc., Portland, Creswick, Keilor basalt plains, Goulburn Valley and Wodonga districts); all States except Qd, but rare in Tas. (north-east).

Diagn.: Inconspicuous grass-like plant; rhizome long, slender, creeping in mud; barren fronds tufted, filiform, bright green, glabrous, up to 3" long, often \pm flexuose; fertile fronds very short and deflexed into mud, terminating in globular, \pm hairy, pill-like sporocarps 2-4 mm. wide.

40. MARSILEA L. (1753)

1. Leaflets *narrowly cuneate to almost linear*; sporocarps *dispersed*, sessile (plants often very small and mat-like):

88. *M. angustifolia* R. Br. *Prodr. Flor. Nov. Holl.* 167 (1810).

Illust.: Wakefield, *Ferns Vict. Tasm.* 53 fig. 10 (1955); Bailey, *Qd Flor.* 6: t. 87 opp. 1929 (1902).

Vern.: Narrow-leaf Nardoo. *Distr.*: Uncommon in Victoria, on drying mud of western river-banks and around permanent waterholes (Glenelg R. near Cherry Pool, Wimmera R. near Dimboola, Murray R. at Mildura, Kulkyn Nat. Forest); N.S.W., Qd and north-coast areas in tropical Australia.

—Leaflets *obovate-cuneate* (sometimes crenulate and \pm fan-shaped); sporocarps *clustered* 2

2. Sporocarps *sessile*; leaflets usually 10-15 mm. long; nodes of rhizome rather distant:

89. *M. hirsuta* R. Br. *Prodr. Flor. Nov. Holl.* 167 (1810).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 57 fig. 3 (1955); Williamson, *Vict. Nat.* 42: 265 fig. 3 (1926); Bailey, *Qd Flor.* 6: t. 87 opp. 1929 (1902).

Vern.: Short-fruit Nardoo. *Distr.*: Uncommon in Victoria, on mud of shallow swamps and lagoons in a few western and northern localities (Darlot's Ck near Portland, Carisbrook, Kulkyn Nat. Forest etc.), with an isolated eastern occurrence at Bairnsdale (Feb. 1953); all States except Tas., Cent. Aust.

—Sporocarps *on conspicuous stalks* (often much longer than themselves); leaflets up to 25 mm. long and broad; nodes of rhizome usually close together:

90. *M. drummondii* A. Br. in *Linnæa* 25: 721 (1853).

Illust.: Mahood in Chippendale, *Poison. Plant. N. Terr.* Pt. 2: fig. 2 (1958); Williamson in Wakefield, *Ferns Vict. Tasm.* 57 fig. 1-2 (1955); Williamson, *Vict. Nat.* 42: 265 fig. 1-2 (1926); Black, *Flor. S. Aust.* ed. 2: fig. 29 (1943); Bailey, *Qd Flor.* 6: t. 87 opp. 1929 (1902); White in Bailey, *Compr. Cat. Qd Flor.* 637 fig. 605 (1913); Mueller, *Key Syst. Vict. Plant.* 2: fig. 128 (1886), as "*M. quadrifolia*"; Fitch in Currey, *J. Bot., Lond.* 1: t. 6 opp. 161, col. (1863), as "*M. macropus*"; Myers in Turner, *Forage Plant. Aust.* t. opp. 92 (1891).

Vern.: Common Nardoo (Clover Fern). *Distr.*: Frequent in western and northern Victoria on swampy depressions, clay-pans and drying waterholes, chiefly in open parts of the interior (Wimmera, Mallee and Murray Valley areas, St. Arnaud, Bacchus Marsh, Keilor basalt plains at Laverton etc., but not east of Melbourne); inland parts of all States except Tas., Cent. Aust., the pounded sporocarps ("seeds") forming part of the diet of aborigines in some arid areas.

[The major criterion purporting to separate this taxon from *M. hirsuta* R. Br., viz. a well-developed stipe to the sporocarp, seems rather trifling; probably *M. drummondii* would be better regarded as a variant or subspecies of *M. hirsuta*.

The totally glabrous, large-leaved *M. mutica* Mett. in *Ann. Sci. nat. ser. 4*, 15: 88 (1861) is recorded for the Murray R. in South Australia, under its synonym *M. brownii* A. Br. (1864), and may occur also in the far north-west of Victoria.]

Family 20. AZOLLACEÆ

41. AZOLLA Lam. (1783)

Plant closely and *regularly branched*, deltoid, often quite red; leaves *thick*, slightly overlapping; roots *feathery* (each with numerous fine lateral rootlets):

91. *A. pinnata* R. Br. *Prodr. Flor. Nov. Holl.* 167 (1810).

Illustr.: Williamson in Wakefield, *Ferns Vict. Tasm.* 68 fig. 1 (1955); Williamson, *Vict. Nat.* 42: 242 fig. 7 (1926); Backer & Posthumus, *Varenflor. Java* fig. 69 (1939).

Vern.: Ferny Azolla. *Distr.*: Seasonal and scattered through lowland Victoria on the surfaces of ponds and river lagoons (e.g. Jeparit, Murray R., Goulburn R., Delatite R., Ovens R., Yarra R. and several parts of East Gippsland), often covering the water as a continuous reddish carpet; S.A., N.S.W., Qd, Japan, tropical Asia & Afr.

Plant *irregularly branched*; leaves *thin*, broad, very imbricate; roots *entire* (without lateral rootlets):

92. *A. filiculoides* Lam. in *Encycl. méth. (Bot.)* 1: 343 (1783).

Illustr.: Lee in Wakefield, *Ferns Vict. Tasm.* t. opp 58 (1955); Williamson in Wakefield *l.c.* 68 fig. 2 (1955); Williamson, *Vict. Nat.* 42: 242 fig. 8 (1926); Black, *Flor. S. Aust.* ed. 2: fig. 30 (1943); Dobbie, *N.Z. Ferns* ed. 4: 282 (1951); Mueller, *Key Syst. Vict. Plant.* 2: fig. 127 (1886); Lauder milk in Benson, *Plant Classification* 542 (1957); Mason, *Flor. Marshes Calif.* fig. 6 f-l (1957); Herter, *Flor. il. Uruguay* 1: fig. 93 (1940); Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 72 (1940); Coste, *Flor. Franc.* 3: fig. 4325 (1906).

Vern.: Pacific Azolla (Red Azolla). *Distr.*: In similar situations to—and often co-extensive with—*A. pinnata*, but of wider range in Victoria (Yarriambiack Ck near Warracknabeal, Goroke, Hopkins R., Murray R., Goulburn R., Avon R., Brodribb R., Sale district, Altona); all States, N.Z., Chile, Argentina and along the Andean chain (ascending to 16,000 ft. alt.) through Central Amer. to Washington State (U.S.A.), naturalized in parts of Europe (incl. Britain).

[Australian populations of this widespread North and South American plant were described as a distinct species *A. rubra* by R. Brown in his *Prodr. Flor. Nov. Holl.* 167 (1810). Strasburger, *Ueber Azolla* 78 (1873), reduced it to a variety of *A. filiculoides*, and as such it appears in Ewart's *Flor. Vict.* 18 (1931). However, H. K. Svenson in *Amer. Fern J.* 34: 77 (1944) points out that *A. filiculoides* var. *rubra* is merely a form "of little if any importance geographically, since it is found scattered throughout the range of the species in America"—its only claim to distinction is the presence of 1 or 2 obscure *septæ* at the very apex of the glochidia projecting from each massula of 64 microspores.]

LYCOPODIINÆ

Family 21. LYCOPODIACEÆ

Leaves few (1-8), all radical, linear; strobilus solitary, on a naked peduncle 1-2" high (renascent herb) 42. *Phylloglossum*

Leaves very numerous, often scale-like, \pm imbricate all along the aerial stems and branches; strobili usually several, sessile or on short \pm leafy peduncles (rhizomic evergreen perennials) 43. *Lycopodium*

42. PHYLLOGLOSSUM Kunze (1843)

93. *P. drummondii* Kunze in *Bot. Ztg.* 1: 721 (1843).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 64 fig. A (1955); Williamson, *Vict. Nat.* 44: 226 fig. A (1927); Osborn, *Trans. roy. Soc. S. Aust.* 42: 3, 5, 11, t. 1 fig. 2 (1918); Mueller, *Key Syst. Vict. Plant.* 2: fig. 131 (1886); Warburg, *Pflanzenwelt* 1: 294 (1913); Fitch in Hooker, *Icon. Plant.* 10: t. 908 (1854); Dawson, *Tuatara* 5: 9 fig. 7 (1953).

Vern.: Pigmy Clubmoss. *Distr.*: Occasional in Victoria (and seldom collected), forming extensive colonies on wet peaty soil of near-coastal heaths and swamps (Lower Glenelg R., Portland, Grampians, Port Fairy, Port Phillip area where now extremely rare, Upper Narre-warren, Tonimbuk, Wilson Prom., Wonthaggi, Marlo, Reedy Ck near Cann R., Wingan R., Mallacoota—widespread on grass-tree flats of far East Gippsland); Tas. (north and rare), N.S.W. (south-east), S.A., W.A. (rare), N.Z.

Diagn.: Small inconspicuous plant, strongly resembling the embryonic phase of certain *Lycopodium* spp. (e.g. *L. cernuum* L.), usually <2" high; rootstock very small, renewed annually by a whitish tuber; leaves radical, few (1-8), \pm fleshy, linear-subulate, 1-2 cm. long, acute; strobilus solitary, erect, 4-8 mm. long, oblong-ovoid, on a slender leafless peduncle 2-3 times as long as leaves; bracts 10-30, broad but pointed and longer than sporangia.

43. LYCOPODIUM L. (1753)

1. Leaves separated, distichous (forming 2 rows in one plane, with minute intervening leaves on under-side of branches), 3-5 mm. long; stems \pm prostrate, much branched; strobilus 10-12 mm. long, terminating a branch, the bracts very broad and yellowish with white margins:

94. *L. scariosum* Forst. f. *Flor. Ins. Aust. Prodr.* 87 (1786).

Illust.: Wakefield, *Ferns Vict. Tasm.* 62 (1955); Williamson in Wakefield *l.c.* 60 fig. c (1955); Williamson, *Vict. Nat.* 44: 223 fig. c (1927); Ewart, *Flor. Vict.* fig. 8 (1931); Fitch in Hooker, *Icon. Plant.* 10: t. 966 (1854); Holloway, *Trans. N.Z. Inst.* 51: t. 12 fig. 2 b, opp. 181 (1919); Dawson, *Tuatara* 5: 9 fig. 4 (1953).

Vern.: Spreading Clubmoss. *Distr.*: Extremely localized and rare in Victoria, where known only from the shaded margins of sphagnum bog at Mt. Erica (Baw Baws) and heads of Middle Ck (Bogong High Plains) in the alps; Tas. (where not uncommon), extending to N.Z., Chatham & Auckland Is and S. America.

- Leaves crowded, spirally imbricate all around the stem 2
2. Leaves <6 mm. long (or, if more, then finely pointed and almost hair-like) 4
 Leaves >6 mm. long, lanceolate, manifestly flattened, shortly acute; stems little branched (uncommon plants of mountain peaks and high alps) 3
3. Sporangia in slender terminal spikes up to 4" long; bracts in 4 rows, resembling stem-leaves but much shorter (plants 6-12" tall):

95. *L. varium* R. Br. *Prodr. Flor. Nov. Holl.* 165 (1810).

Illustr.: Williamson in Wakefield, *Ferns Vict. Tasm.* 60 fig. F (1955); Williamson, *Vict. Nat.* 44: 223 fig. F (1927); White, *Qd Nat.* 12: t. opp. 32 (1942); Holloway, *Trans. N.Z. Inst.* 51: t. 9 fig. 1, opp. 168 (1919); Fitch in Hooker f., *Flor. Tasm.* 2: t. 170 B-F, col. (1859); Dawson, *Tuatara* 5: 11 fig. 11 (1953).

Vern.: Long Clubmoss (Tall Clubmoss). *Distr.*: Extremely localized and rare in Victoria, where known only from the Victoria Range (Grampians), Calder R. in the Otways, also from granite rock-ledges near the summits of Mt. Kaye and Genoa Peak (East Gippsland); south-eastern N.S.W. & S. Qd (rare), Furneaux Group (Bass Strait), Tas., N.Z. (all islands and not uncommon), Lord Howe Id.

- Sporangia borne in the upper leaf-axils, not forming a separate spike; bracts never 4-ranked, quite similar to stem-leaves (plants rarely >6" tall):

96. *L. selago* L. *Spec. Plant.* 2: 1102 (1753).

Illustr.: Williamson in Wakefield, *Ferns Vict. Tasm.* 60 fig. D (1955); Williamson, *Vict. Nat.* 44: 223 fig. D (1927); Ewart, *Flor. Vict.* fig. 9 (1931); Holloway, *Trans. N.Z. Inst.* 51: t. 9 fig. 2, t. 10 fig. 1 opp. 169 (1919); Mueller, *Key Syst. Vict. Plant.* 2: fig. 130 (1885); Fitch in Hooker f., *Flor. Tasm.* 2: t. 170 A, col. (1859); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 11 fig. 1, col. (1906); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1261 (1931); Makino, *Ill. Flor. Jap.* 1189 (1924); Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 92 (1940).

Vern.: Fir Clubmoss. *Distr.*: In Victoria restricted to the higher alps, usually in shaded grassy places beneath tangles of *Podocarpus lawrencei* etc. at 5000-6000 ft. alt., and uncommon (Baw Baws, Mt. Stirling, Mt. Hotham, Bogong High Plains); similar situations in south-eastern N.S.W., Tas., N.Z. (where more frequent), and almost cosmopolitan in cool montane habitats.

[Occurrences in the south-east Australian alps depart more or less from the typical boreal form of *L. selago*, and their exact status is not yet quite clear; they bear a close relationship to *L. saururus* Lam. in *Encycl. meth. (Bot.)* 3: 653 (1791) which was described from Mauritius but has been accorded a wide distribution among circum-Antarctic islands by later writers.]

4. Stems rigidly erect, 1-3 ft. high, very much branched, the whole plant rather narrow and appearing like a miniature pine or fir-tree; strobili 1-2 cm. long, numerous, terminating the upper, very slender leafy branches; bracts broadly ovate, yellowish:

97. *L. deuterodensum* Herter *Index Lycopod.* 15 (1949).

L. densum Labill. *Nov. Holl. Plant. Specim.* 2: 104, t. 251 fig. 1 (1807), non Lam. (1778).

Illustr.: Labillardière (*l.c.*); Williamson in Wakefield, *Ferns Vict. Tasm.* 60 fig. A (1955); Williamson, *Vict. Nat.* 44: 223 fig. A (1927), as "*L. densum*"; Holloway, *Trans. N.Z. Inst.* 51: t. 13 opp. 192 (1919), as "*L. densum*"; Galbraith, *Wild-flowers Vict.* t. 4 (1950), as "*L. densum*"; Dawson, *Tuatara* 5: 9 fig. 1 (1953), as "*L. densum*".

Vern.: Bushy Clubmoss. *Distr.*: Widespread but scattered in Victoria, usually on damp peaty soil in lightly forested tracts not far from the coast (Grampians where rather frequent, W. Otways, near Flinders, near Warburton, Nangana near Cockatoo, Tonimbuk, Wilson Prom., Orbost, Genoa, Cape Howe); S.A. (Mt. Lofty Range), Tas. (frequent), N.S.W., Qd, Norfolk Id, N. Cal., N.Z., Chatham Id.

—Stems up to 1 ft. high (if plant pine-like, then either not erect or with lateral fruiting spikes); strobili few (1-6) 5

5. Strobili *terminal*, 2-4 cm. long, carried high above the foliage on slender, almost leafless peduncles; bracts *ovate-lanceolate* (\pm erect, much branched mountain plant):

98. *L. fastigiatum* R. Br. *Prodr. Flor. Nov. Holl.* 165 (1810).

L. clavatum sens. Ewart *Flor. Vict.* 27 (1931), atque auctt. Aust. plur., non L. (1753).

Illustr.: Williamson in Wakefield, *Ferns Vict. Tasm.* 60 fig. E (1955); Williamson, *Vict. Nat.* 44: 223 fig. E (1927), as "*L. clavatum*"; Holloway, *Trans. N.Z. Inst.* 51: t. 14 A-B, opp. 193 (1919); Cockayne in Engler & Drude, *Veg. Erde* ed. 2, 14: t. 86 (1928).

Vern.: Mountain Clubmoss (Common Clubmoss). *Distr.*: Not uncommon in sub-alpine woodland and bog formations of the highlands in eastern Victoria, often in shaded places along streams (Lake Mtn., Baw Baws, Mt. Buller, Bogong High Plains, Upper Delegate R., Nunniong Plateau etc.); Tas., N.S.W., Qd (south), N.Z., Chatham, Auckland, Campbell & Antipodes Is.

—Strobili *lateral*; bracts *broadly ovate*, cuspidate (plant prostrate or very little branched) 6

6. Stems *erect*, undivided or once to twice branched; leaves \pm 6 mm. long, very narrow and hair-like; strobili \pm *sessile*, 5-15 mm. long:

99. *L. laterale* R. Br. *Prodr. Flor. Nov. Holl.* 165 (1810).

Illustr.: Wakefield, *Ferns Vict. Tasm.* t. opp. 59 (1955); Williamson in Wakefield *l.c.* 60 fig. B (1955); Williamson, *Vict. Nat.* 44: 223 fig. B (1927); Holloway, *Trans. N.Z. Inst.* 51: t. 12 fig. 1 A, opp. 181 (1919); Bailey, *Synops. Qd Flor.* suppl. 3 (1890); Dawson, *Tuatara* 5: 9 fig. 3 (1953).

Vern.: Slender Clubmoss. *Distr.*: Scattered through southern Victoria, but locally abundant on peaty ground among sedges and shrubs not far from the sea (Grampians, Otways, Port Phillip area where now scarce, Bunyip R. & Tonimbuk, Beenak, Wilson Prom. and many parts of East Gippsland); S.A., Tas. (frequent), N.S.W., Qd, N. Cal., N.Z., Chatham Id.

—Stems *prostrate*, divaricately branched, *very brittle*, rooting tightly on muddy soil; leaves crowded, \pm 4 mm. long, tapering into sharp points; strobili *erect*, 2-3 cm. long, on *pale peduncles* of about equal length:

100. *L. carolinianum* L. *Spec. Plant.* 2: 1104 (1753).

Illust.: Wakefield, *Ferns Vict. Tasm.* t. opp. 59 (1955), *l.c.* 68 fig. 3 (1955); Holloway, *Trans. N.Z. Inst.* 51: t. 14 c, opp. 193 (1919), as "*L. drummondii*"; Dawson, *Tuatara* 5: 11 fig. 10 (1953), as "*L. drummondii*"; Herter, *Flor. il. Uruguay* 1: fig. 99 (1940).

Vern.: Bog Clubmoss. *Distr.*: Extremely localized in Victoria, where known only from a peaty bog on Maramingo Ck in far East Gippsland, within 5 miles of the New South Wales border; Tas. (Safety Cove, Port Arthur), S.A. (Mt. Compass and Square Waterhole), W.A. (extremely rare), Qd (south and rare); N.Z. (North Cape area of North Id and rare), N.G., Indonesia, Malaya, Ceylon, Mascarene Is, S. Afr., Guinea, N. & S. Amer.

[There is some doubt concerning the absolute identity of southern Australian populations with typical *L. carolinianum* of North America, although they are remarkably close. J. M. Black in *Flor. S. Aust.* ed. 2: 42 (1943) has assigned South and Western Australian material to *L. serpentinum* Kunze in Lehm. *Plant. Preiss.* 2: 108 (1846), of which *L. drummondii* Spring *Mém. Acad. R. Belg.* 24: 35 (1849) is a synonym; but other Australian writers prefer to use *L. carolinianum*, in its wide sense, pending a critical modern revision of the whole group.]

Family 22. SELAGINELLACEÆ

44. SELAGINELLA Pal. Beauv. (1805)

1. Stems weak, trailing, repeatedly branched, jointed at nodes; leaves tender, complanate, distichous, the larger lateral ones (2-4 mm. long) alternating with minute dorsal leaves:

101. **S. kraussiana* (Kunze) A. Br. in *Ind. Sem. Hort. Berol.* 22 (?1859).
Lycopodium kraussianum Kunze in *Linnaea* 18: 114 (1844).

Illust.: Herter, *Flor. il. Uruguay* 1: fig. 106 (1940); Makino, *Ill. Flor. Jap.* 1181 (1924); Troll, *Flora, Jena* 129: 104 (1934); Warburg, *Pflanzenwelt* 1: 299 (1913); Sims, *Ferns S. Afr.* ed. 2: 182 (1915).

Vern.: Garden Selaginella (Creeping Clubmoss, Krauss Selaginella). *Distr.*: Native to Africa (Cape Province, Natal, Fernando Po, Cameroon Mts. etc.), Azores and Madeira, reported also from Sicily; the most commonly cultivated species in gardens, whence often escaping, naturalized in S. Amer., Japan, southern Britain (Cornwall) and several parts of Victoria (e.g. Malleson's Glen in Don R. Valley, Monbulk Ck at Belgrave, Main Ck 7 miles south from Arthur's Seat, Byaduk Caves).

—Stems rigidly erect; leaves stiff, pointed, keeled, not distichous, all similar

2

2. Rhizomic perennial 2-8" high, usually pinnately branched in one plane, often \pm fan-like; leaves 2-3 mm. long:

102. *S. uliginosa* (Labill.) Spring in *Mém. Acad. R. Belg.* 24: 60 (1849).
Lycopodium uliginosum Labill. *Nov. Holl. Plant. Specim.* 2: 104, t. 251 fig. 2 (1807).

Illust.: Labillardière (*l.c.*); Williamson in Wakefield, *Ferns Vict. Tasm.* 64 fig. B (1955); Williamson, *Vict. Nat.* 44: 226 fig. B (1927).

Vern.: Swamp Selaginella (Swamp Clubmoss). *Distr.*: Widespread and frequent on the near-coastal heaths of southern Victoria, usually on wet peaty soil amongst sedges (e.g. Grampians, Portland, Tonimbuk, Wilson Prom. and many parts of East Gippsland); all States except S.A., but apparently rare in W.A. (Albany area), Arnhem Land (remarkably isolated occurrence).

—Tufted annual <2" high, the stems *undivided* or forked once or twice; leaves usually <2 mm. long:

103. *S. gracillima* (Kunze) Alston in *J. Bot., Lond.* 69: 257 (1931).

Lycopodium gracillimum Kunze in *Lehm. Plant. Preiss.* 2: 109 (1846);

S. preissiana Spring in *Mém. Acad. R. Belg.* 24: 61 (1849).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 64 fig. c (1955); Williamson, *Vict. Nat.* 44: 226 fig. c (1927); Black, *Flor. S. Aust.* ed. 2: fig. 31 (1943); Bailey, *Synops. Qd Flor.* suppl. 3 (1890); Goebel, *Organogr. Plant.* Engl. ed. 2: fig. 338 (1905)—all as "*S. preissiana*".

Vern.: Tiny Selaginella (Tiny Clubmoss). *Distr.*: Similar situations to *S. uliginosa* and sometimes co-extensive, but rather less common in Victoria (Lower Glenelg R., Grampians, Port Phillip area, Wilson Prom., Fernbank, Ewing's Morass, Marlo & Coringle); temperate parts of all States.

Family 23. ISOËTACEÆ

45. ISOËTES L. (1753)

Rootstock 3-lobed; sporangia large, *naked*, liver-brown (annual up to 4" high, growing in shallow water or on mud):

104. *I. drummondii* A. Br. in *Mber. Akad. Wiss., Berl.* 1863: 593 (1864).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 64 fig. F (1955); Williamson, *Vict. Nat.* 44: 226 fig. F (1927); Osborn, *Ann. Bot., Lond.* 36: 42-46, 49, 52 (1922).

Vern.: Plain Quillwort. *Distr.*: Scattered through western and north-eastern Victoria in shallow temporary pools or even damp earth on open plain country, sometimes on basaltic soil (Lower Glenelg R., Hawkesdale, Creswick, near Beechworth), but nowhere frequent; all States except Qd, but apparently localized and rare in both Tas. (at George Town, Jan. 1955) and N.S.W.

Rootstock 2-lobed; sporangia completely *veiled* by a *pale membranous indusium* (normally perennial, up to 6" or even 9" long, often growing submerged in rock pools):

105. *I. humilior* F. Muell. ex A. Br. in *Linnaea* 25: 722 (1853).

I. drummondii sens. Ewart. *Flor. Vict.* 19 (1931) *pro parte, non strict.* A. Br. (1864).

Illust.: Wakefield, *Ferns Vict. Tasm.* 68 fig. 6 (1955).

Vern.: Rock Quillwort. *Distr.*: Scattered through Victoria and uncommon in the east, where growing in rock pools, often submerged along permanent water-courses (Genoa R. gorge, Little R. Falls near Wulgulmerang, Pine Mountain, Mt. Pilot near Chiltern), but in the west becoming an annual and not uncommon on temporarily wet clay-depressions of the Wimmera region (Serviceton, Nhill, Minyip, Little Desert near Goroke etc.); Tas. (S. Esk River and very rare), otherwise widespread in temperate parts of all other States.

PSILOPHYTINÆ

Family 24. PSILOTACEÆ

Stems *rigid, repeatedly forked*; leaves few, scattered, *scale-like*, <2 mm. long;
 sporangia 3-lobed 46. *Psilotum*

Stems *flaccid, undivided*; leaves *prominent, flattened*, > 10 mm. long; sporangia
 2-lobed 47. *Tmesipteris*

46. *PSILOTUM* Swartz in Schrad. (1801)

106. *P. nudum* (L.) Griseb. in *Mitt. Bot. 1*: 403 (1874).

Lycopodium nudum L. *Spec. Plant. 2*: 1100 (1753).

Illust.: Williamson in Wakefield, *Ferns Vict. Tasm.* 64 fig. E (1955); Williamson, *Vict. Nat.* 44: 226 fig. E (1927); Ewart, *Flor. Vict.* fig. 6 A-B (1931); Lauder milk in Benson, *Plant Classification* 535 (1957); Makino, *Ill. Flor. Jap.* 1183 (1924); Domin, *Bibl. bot., Stuttgart 20* (Heft 85): 233 fig. 56 (1915); Pritzel, *Natürl. PflFam. 1⁴*: 609 fig. 382 (1902), as "*P. triquetrum*"; Hubbard, *Hawaii Nature Notes* 5¹: central t. [7] (1952); Wettstein in Backer & Pothsumus, *Varenflor. Java* fig. 80 (1939); Aiken, *Tuatara 4*: 51 fig. E-H (1951), as "*P. triquetrum*".

Vern.: Skeleton Fork-fern (Skeleton Clubmoss). *Distr.*: Very localized and rare in Victoria where known only from dry exposed rock-crevices on Mitre Rock and Mt. Zero (Grampians area) and at Ballantyne Hills near Suggan Buggan (East Gippsland); N.S.W., Qd, Central Australia, N.Z., and widespread in warmer parts of all the continents—tropical populations commonly adopt an epiphytic habit, on trees and palms.

Diagn.: Rhizome short, much-branched; stems tough, rigid, up to 15" long, with acute longitudinal ridges, repeatedly forked above to form a coral-like tuft of small triquetrous branches, the whole becoming yellowish or bronzy with age; leaves minute, pointed and scale-like, 1-2 mm. long, scattered; sporangia lateral to upper branches, each in the axil of a forked bract, ± 2 mm. wide, with 3 equal rounded lobes (loculi).

47. *TMESIPTERIS* Bernh. in Schrad. (1801)

1. Leaves > 15 mm. long, > 3 mm. wide, *bluntly tipped* but mid-vein projecting as a fine point; sporangia about 5 mm. long, *pointed at each end* (stems up to 2 ft. long):

107. *T. billardieri* Endl. *Prodr. Flor. Norfolk.* 6 (1833).

T. tannensis sens. Ewart *Flor. Vict.* 25 (1931), atque auctt. plur., non Bernh. in Schrad. (1801).

Illust.: Reeves in Wakefield, *Ferns Vict. Tasm.* t. opp 58 (1955); Williamson in Wakefield *l.c.* 64 fig. D (1955); Williamson, *Vict. Nat.* 44: 226 fig. D (1927), as "*T. tannensis*"; Watson, *Vict. Nat.* 64: t. 7 opp. 84 (1947); Mueller, *Key Syst. Vict. Plant. 2*: fig. 129 (1886), as "*T. tannensis*"; Labillardière, *Nov. Holl. Plant. Specim. 2*: t. 252 (1807), as "*T. tannensis*".

Vern.: Long Fork-fern (Fern Clubmoss). *Distr.*: Not uncommon on fibrous tree-fern (*Dicksonia*) trunks in southern Victoria (Little Moleside Ck on Lower Glenelg R., Grampians, Otways, Dandenongs, Upper Yarra & South Gippsland ranges, Wilson Prom. and many parts of East Gippsland; Tas., N.S.W. (extending as far north as Blue Mtns.).

—Leaves <15 mm. long, <3 mm. wide; sporangia <3 mm. long, *rounded at the ends* (stems <6" long) 2

2. Leaves narrow, \pm *curved*, the apex *tapering to an acute point*:

108. *T. parva* N. A. Wakefield in *Vict. Nat.* 60: 143, cum fig. (1944).

Illust.: Wakefield (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 67 fig. 2 (1955); Ewart, *Flor. Vict.* fig. 6 C-D (1931), as "*T. tannensis*".

Vern.: Small Fork-fern. *Distr.*: On tree-fern trunks in shaded gullies and jungles of Dandenong Ranges, Waratah Bay, Wilson Prom., Mt. Drummer and Howe Ranges, but uncommon; also extending to Blue Mtns., N.S.W.

—Leaves elliptic to oblanceolate, *straight*, the apex *rounded* but mid-vein excurrent as a fine point:

109. *T. ovata* N. A. Wakefield in *Vict. Nat.* 60: 143, cum fig. (1944).

Illust.: Wakefield (*l.c.*); Wakefield, *Ferns Vict. Tasm.* 67 fig. 1 (1955).

Vern.: Oval Fork-fern. *Distr.*: Very localized and rare on tree-fern trunks at Mt. Drummer and Howe Ranges in far eastern Victoria, with a single record for Dandenong Ranges (Jan. 1853); also N.S.W., Qd.

SPERMATOPHYTA

(Seed-bearing plants)

GYMNOSPERMÆ

(Conifers etc.)

Family 25. PODOCARPACEÆ

48. PODOCARPUS L'Hér. ex Pers. (1807)

110. *P. lawrencei* Hook. f. in Hook. *Lond. J. Bot.* 4: 151 (1845).

P. alpina R. Br. ex Mirb. in *Mém. Mus. Hist. nat., Paris* 13: 75 (1825)—*nomen nudum*;

P. alpina R. Br. ex Hook. f. *Flor. Tasm.* 1: 356 (1857).

Illust.: Hunter, *Vict. Nat.* 58: 10 (1941); Gordon in Ewart, *Handb. For. Trees* t. 9 (1925); Schoenfeld in Ewart, *Plant. indig. Vict.* t. 92 opp. 29 (1910); Clinton-Baker & Jackson, *Ill. new Conif.* t. 74 (1935)—all as "*P. alpina*".

Vern.: Mountain Plum Pine (Mountain Yew—Tas.). *Distr.*: Scattered on higher mountains of eastern Victoria (Lake Mountain, Baw Baws, Mts. Buller, Stirling, Buffalo, Speculation, Hotham, Feathertop, Bogong High Plains, Cobboras, Goonmirk Range etc.), rarely below 4000 ft. but descending to altitudes of ± 3000 ft. and attaining maximum size on Goonmirk Range, E. Gippsland; also Tas., N.S.W. (south-eastern alps).

Diagn.: Low, densely branched shrub, decumbent and sprawling over rocks when exposed at elevations above 5000 ft., but (with shelter) occasionally a forest tree to 25 ft. high and ± 1 ft. in diameter at base of trunk; bark smooth, pale coppery-brown and inclined to peel in papery sheets; leaves rigid, leathery, aromatic, sessile, obtuse, oblong-linear, 0.5-1.5 cm. \times 1.5-2.5 mm., with midrib prominent on under-surface; male amentum 10-15 mm. long, purplish before release of pollen from microsporophylls; female amentum 1- or 2-ovulate, the receptacle finally 3-4 mm. long, bright red and succulent (as in the fruiting pedicel of *Exocarpos* spp.); seed ovoid, crested, 3-6 mm. long.

Family 26. CUPRESSACEÆ

49. CALLITRIS Vent. (1808)

1. Whorls of decurrent leaves 3-5 per cm. along branchlets; dorsal surface of leaf *keeled* (giving branchlets a *coarse angular* appearance); cones <16 mm. in diameter 4

Whorls of decurrent leaves 6-9 per cm.; dorsal surface of leaf *rounded* (giving branchlets a finely *terete* appearance); cones >16 mm. in diameter 2

2. Cone-scales *thin, separating almost to the base* as cone opens up, *never tuberculate*; columella usually slender (straight tree with single trunk to 60 ft. high, the cones rarely remaining on branches long after maturity):

111. *C. columellaris* F. Muell. *Fragm. Phyt. Aust.* 5: 198 (1866).

C. robusta sens. Ewart *Flor. Vict.* 61 (1931), *non* (A. Cunn. ex Parl.) F. M. Bailey (1902);

C. glauca R. Br. ex R. T. Baker & H. G. Sm. in *Proc. roy. Soc. N.S.W.* 42: 146 (1908)—*nom. illeg.*;

C. arenosa A. Cunn. ex R. T. Baker & H. G. Sm. *Pines of Australia* 157 (1910)—*nom. illeg.*;

C. intratropica R. T. Baker & H. G. Sm. *Pines of Australia* 172 (1910).

Illust.: Blake, *Proc. roy. Soc. Qd* 70: t. 1 opp. 46 (1959); Morrison, *Melbourne's Garden* t. opp. 123 (1946), as "*C. arenosa*"; Nicholls, *Vict. Nat.* 58: t. 24 (1942), as "*C. glauca*"; Black, *Flor. S. Aust.* ed. 2: fig. 32 (1943), as "*C. glauca*"; Henderson, *Gum Tree* 7th: 16 (1923), as "*C. robusta*"; Lane-Poole, *Bull. For. Dep. W. Aust.* n. 2: 130 (1921), as "*C. glauca*"; Schoenfeld in Ewart, *Plant. indig. Vict.* t. 93 opp. 30 (1910), as "*C. verrucosa*"; Taylor in Baker & Smith, *Pines of Australia* t. opp. 37 fig. 5-7 (1910), as "*C. glauca*", "*C. arenosa*" & "*C. intratropica*" respect.; Baker & Smith, *l.c.* t. opp. 118 (1910), as "*C. glauca*"; Taylor in Baker & Smith *l.c.* t. opp. 159 (1910), as "*C. arenosa*"; Flockton in Maiden, *For. Flor. N.S.W.* 2: t. 47 fig. A-J (1907), as "*C. robusta*", *l.c.* fig. s-w (1907), as "*C. columellaris*"; Maiden, *Agric. Gaz. N.S.W.* 18: 657 (1907), as "*C. robusta*"; Cambage, *Proc. Linn. Soc. N.S.W.* 29: t. 25 (1905), as "*C. robusta*"; Cheeseborough, *Agric. Gaz. N.S.W.* 10: t. opp. 1227 (1899), as "*C. verrucosa*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 111 (1886), as "*C. verrucosa*".

Vern.: White Cypress Pine (Coast Cypress Pine, Murray Pine, Western Pine). *Distr.*: Northern Victoria, forming open woodlands on loamy plains and sandy rises of the Murray and Goulburn Valleys (Kulkyne Nat. Forest, Swan Hill, Mitiamo, Nathalia, St. James, Wangaratta etc.) but now much reduced and becoming rarer through agricultural pursuits, also on dry slopes of the Upper Snowy, Deddick and Suggan Buggan Rivers in East Gippsland, and along river cliffs near Bacchus Marsh and Sydenham (where now almost extinct); drier and inland parts of all States except Tas., N. & Cent. Aust.

[S. T. Blake in *Proc. roy. Soc. Qd* 70: 34-37 (1959) has set out the synonymy of this species in detail, discussing the confusion that has beset its nomenclature, even as late as Miss J. Garden's revision of the genus *Callitris* in *Contr. N.S.W. Herb.* 2: 363-392 (1957). He draws attention to the great variability among individual trees of *C. columellaris* in their branching habit, twig size, colour of foliage (glaucous or otherwise), shape of smaller cone-scales and configuration of columella—features that display no correlation whatever. Garden (*l.c.* 368) had followed Franco in *An. Inst. sup. Agron., Lisboa* 19: 12 (1952) by adopting the name *C. hugelii* (Carr.) Franco for the inland form of White Cypress Pine, but Blake shows that the original description of *Frenela hugelii* Carr. applies much better to forms of *C. preissii* Miq. (q.v.).

C. columellaris is a slow-growing conifer, but may attain heights of 60-80 ft.; the dense, darkish, aromatic timber is valuable for its resistance to insect attack, notably termites.]

—Cone-scales *thick*, permanently *adhering toward base*, often *tuberculate*; columella usually short and thick (cones remaining on the branches for years after maturity) 3

3. Cones 25 mm. (1") or more in diameter, sometimes bearing large \pm scattered tubercles or almost smooth (tree with single trunk to 60 ft.):

112. *C. preissii* Miq. in Lehm. *Plant. Preiss* 1: 643 (1845).

C. robusta (A. Cunn. ex Parl., ut *Frenela* sp., 1868) F. M. Bailey *Qd. Flor.* 5: 1496 (1902);

C. gracilis R. T. Baker in *Proc. Linn. Soc. N.S.W.* 28: 839, t. 45 (1903);

C. propinqua R. Br. ex R. T. Baker & H. G. Sm., *Pines of Australia* 112 (1910).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 33 (1943), as "*C. propinqua*"; Rossiter in Ewart, *Handb. For. Trees* t. 6 (1925), as "*C. robusta*"; Baker & Smith, *Pines of Australia* t. opp. 89 (1910), as "*C. robusta*"; Baker & Smith, *l.c.* t. opp. 110 (1910), as "*C. propinqua*"; Baker, *Proc. Linn. Soc. N.S.W.* 28: t. 45 (1903), as "*C. gracilis*".

Vern.: Slender Cypress Pine (Rottneist Island Pine—W.A. form). *Distr.*: Not uncommon in open woodland on sandy rises—forming a Pine-Belah alliance with *Casuarina cristata*—in the Victorian Wimmera (Mt. Arapiles, Little & Big Deserts, Dimboola, Nhill, Jeparit etc.) and Mallee (Wyperfeld Nat. Park, Ouyen, Walpeup, Kulkyn Nat. Forest, Annuello, Woomelang, Piangil, Swan Hill etc.); N.S.W., S.A., W.A.

[An occurrence at the Quarantine Station near Portsea (Port Phillip Heads) is isolated and probably a result of deliberate planting. J. Garden, in *Contr. N.S.W. Herb.* 2: 373 (1957), treats *C. propinqua* as a new subspecies (*murrayensis*) of *C. preissii*. Victorian populations of the species have comparatively narrower (longer than broad) and less coarsely tuberculate mature cones than in the typical coastal form of Western Australia.]

—Cones usually <25 mm. in diameter, densely *warted all over* with small rounded tubercles (small stunted tree rarely exceeding 20 ft.; trunks often several):

113. *C. verrucosa* (A. Cunn. ex Endl.) F. Muell. *Ess. Plant. coll. Fitzalan* 19 (1860).

Frenela verrucosa A. Cunn. ex Endl. *Synops. Conif.* 37 (1847).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 36 (1943); Baker & Smith, *Pines of Australia* t. opp. 101 (1910); Flockton in Maiden, *For. Flor. N.S.W.* 2: t. 46 fig. A & D-H (1907).

Vern.: Scrub Cypress Pine (Mallee Pine, Cow Pine, Turpentine Pine). *Distr.*: Restricted in Victoria to Mallee sand-ridges, where locally frequent in the northern parts of Big Desert, Wyperfeld Nat. Park, Kulkyn Nat. Forest and many other parts of Far N.W. Victoria.

[J. Garden, in *Contr. N.S.W. Herb.* 2: 375 (1957), relegates this taxon to a subspecies of *C. preissii*; but Victorian populations appear to be as distinct from *C. preissii* as the latter is from *C. columellaris*, and it is preferred to retain *C. verrucosa* here at the rank of species. Garden (*l.c.*) also assumes hybridism between these

three entities. Intermediate states between *C. columellaris* and *C. preissii* certainly exist in Victoria and are sometimes difficult to name; but definite evidence of their hybrid origin is at present lacking.]

4. Cone-scales *widened upwards, brown, wrinkled*, each with a bold and *broadly conical dorsal protuberance*; columella short, 3-lobed (shrubs or small trees, rarely higher than 20 ft.):

114. *C. rhomboidea* R. Br. ex L. C. Rich. *Comment. bot. Conif. Cycad.* 47, t. 18 fig. 1 (1826).

C. cupressiformis F. Muell. *Key Syst. Vict. Plant.* 1: 402 (1888);

C. tasmanica (Benth., ut *C. rhomboidea* var. *tasmanica*) R. T. Baker & H. G. Sm. *Pines of Australia* 233 (1910).

Illust.: Richard (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 35 (1943), as "*C. tasmanica*"; Ewart, *Handb. For. Trees* t. 7 (1925), as "*C. cupressiformis*"; Baker & Smith, *Pines of Australia* t. opp. 222 (1910); Baker & Smith *l.c.* t. opp. 237 (1910), as "*C. tasmanica*"; Flockton in Maiden, *For. Flor. N.S.W.* 2: t. 48 fig. R-Z (1907), as "*C. cupressiformis*"; Clinton-Baker & Jackson, *Ill. new Conif.* t. 40 (1935); Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): fig. 61 (1915), as "*C. cupressiformis*".

Vern.: Oyster Bay Pine (Port Jackson Pine). *Distr.*: Scattered on coastal granitic hills in far eastern Victoria (Howe Ranges & Wingan Inlet), frequent on sandstone ridges of the Grampians, Black Range and Mt. Arapiles, extending to crests of Mallee sandhills in the Little Desert and S.W. portions of Big Desert; all States except W.A. (including eastern islands of Bass Strait), but occurrences chiefly coastal or near-coastal, also naturalized on damaged forest land near Auckland (N.Z.).

—Cone-scales \pm *narrowed upwards, blackish, not wrinkled*, each with a small (often recurved) *dorsal point near apex*; columella very short, usually of 3 or 4 separate parts (small tree with single trunk, on dryish rocky hills of north-east):

115. *C. endlicheri* (Parl.) F. M. Bailey *Synops. Qd Flor.* 497 (1883).

Frenela endlicheri Parl. in *DC. Prodr.* 16²: 449 (1868);

C. calcarata R. Br. ex F. M. Bailey *Qd Flor.* 5: 1497 (1902).

Illust.: Ewart, *Handb. For. Trees* t. 8 (1925); Baker & Smith, *Pines of Australia* t. opp. 194 (1910); Flockton in Maiden, *For. Flor. N.S.W.* 2: t. 48 fig. K-Q (1907); Cambage, *Proc. Linn. Soc. N.S.W.* 29: t. 24 (1905); Clinton-Baker & Jackson, *Ill. new Conif.* t. 38 (1935)—all as "*C. calcarata*".

Vern.: Black Cypress Pine (Red Cypress Pine, Mountain Pine). *Distr.*: Scattered on granitic hills of N.E. Victoria (Warby Range, Mayday Hills, Beechworth district, Walwa, Pine Mountain), also on dryish sandy slopes of Snowy R. at McKillop's Bridge and along Lower Deddick R. in East Gippsland; N.S.W. (abundant over much of the tableland areas), Qd (south-east).

[Although neither spreading spontaneously nor strictly naturalized, two other members of the family *Cupressaceæ* are widely grown throughout southern Victoria and are very familiar in towns, along the coast or as windbreaks for farms. These are *Cupressus macrocarpa* Hartweg (Monterey Cypress) and *C. sempervirens* L. (Mediterranean Cypress), both existing in many ornamental forms (or cultivars) some of which are popular for clipped hedge-work. The former has an extremely limited natural range—only at Carmel Bay near Monterey, California, but the

closely related, more glaucous *C. guadalupensis* (sometimes considered as a geographical variant of *C. macrocarpa*) occurs on Guadalupe Island off the north-west coast of Mexico. In Australia it often becomes a large, massive, widely spreading, flat-crowned tree, branching low down. The Southern European *C. sempervirens* (ranging from Italy to northern Persia) is very similar to *C. macrocarpa* but is usually of narrower habit, differing also in its *flattened* branchlets, leaves *not* swollen toward the tips, and seeds *without* any resin-tubercles.]

Family 27. *PINACEÆ

50. *PINUS L. (1753)

1. Needle-leaves *in clusters of 3*, densely massed, bright or deep green, *soft in texture*, 4-6" long; cones usually 3-4" wide, very *obliquely ovoid*, with rather smooth rounded scales (buds resinous, with closely appressed scales):

116. **P. radiata* D. Don in *Trans. Linn. Soc. Lond.* 17: 442 (1837).
P. insignis Dougl. ex Loud. *Arb. Frut. Brit.* 4: 2265, fig. 2170-72 (1838).

Illust.: Loudon (*l.c.*); Lauder milk in Benson, *Plant Classification* 491-494 (1957); Hadfield, *Brit. Trees* fig. 27-28 (1957); Herter, *Flor. il. Uruguay* 1: fig. 133 (1940); Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 123 (1940); Harmsen in den Ouden, *Coniferen Ephedra en Ginkgo* 293 (1949); Clinton-Baker, *Ill. Conif.* 1: t. opp. 26 (1909), as "*P. insignis*".

Vern.: Monterey Pine (Insignis Pine). *Distr.*: Endemic in a small area of hilly terrain near the sea in Monterey County, California (U.S.A.); but now widely planted as a source of softwood timber and for ornament in many temperate parts of Australia and New Zealand, South Africa, and for windbreaks in south-west Britain. With good drainage, mild cool summers and reliable rainfall of 30" +, growth is exceedingly rapid and trees soon attain heights of 100 ft. and more. This is the most important tree of softwood plantations in Victoria and South Australia, wind-blown seed accounting for the frequent encroachment of pines into surrounding bushland areas (e.g. at Creswick, Macedon, Dandenong Ranges, Bright etc.).

—Needle-leaves *in pairs*, dull or greyish-green, hard, *rigid*, \pm *coarse in texture*, with horny points; cones <3" wide toward base, ovoid-conic, not or slightly oblique, their *scales keeled and thickened* near apex 2

2. Leaves >6" long; cones *bright brown*, shining, 3-7" long; seed-body 8 mm. long or more, with wing \pm 1" long; buds *non-resinous*, their scales with *free*, whitish, recurved points:

117. **P. pinaster* Soland. in Ait. *Hort. kew.* 3: 367 (1789).

Illust.: Hadfield, *Brit. Trees* fig. 24 (1957); Herter, *Flor. il. Uruguay* 1: fig. 127 (1940); de Wever in den Ouden, *Coniferen Ephedra en Ginkgo* 286 (1949); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3257, col. (1934), as "*P. maritima*"; Clinton-Baker, *Ill. Conif.* 1: t. opp. 43 (1909); Reichenbach, *Icon. Flor. germ.* 11: t. 525, col. (1849).

Vern.: Cluster Pine (Maritime Pine). *Distr.*: Indigenous to the western coasts of the Mediterranean, including Italy and Corsica; but often planted as a wind-break in exposed parts of southern Victoria where it occasionally appears

spontaneously from wind-blown seed (e.g. at Creswick). This pine is the chief source of turpentine in France.

—Leaves <6" long; cones tawny-yellowish, 1-2.5" long; seed-body 4-6 mm. long; buds \pm resinous, with points of scales closely appressed:

118. **P. nigra* Arnold *Reise nach Mariazell in Steyermark* 8, cum tabl. suppl. (1785)

var. *maritima* (Ait.) R. Melville in *Kew Bull.* 1958: 534 (1959).

P. sylvestris L. var. *maritima* Ait. *Hort. kew.* 3: 366 (1789);

P. laricio Poir. in *Encycl. méth. (Bot.)* 5: 339 (1804), non Santi (1795).

Illust.: *Gum Tree* 17¹: 31 (1938), as "*P. laricio*"; Hadfield, *Brit. Trees* fig. 23 (1957), as "*P. nigra* var. *poiretiana*"; de Wever in den Ouden, *Coniferen Ephedra en Ginkgo* 280 (1949), as "*P. nigra* var. *calabrica*"; Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3255, col. (1934), as "*P. laricio*"; Clinton-Baker, *Ill. Conif. I*: t. opp. 30 (1909), as "*P. laricio*"; Reichenbach, *Icon. Flor. germ.* 11: t. 524, col. (1849), as "*P. laricio*".

Vern.: Corsican Pine. *Distr.*: Indigenous to Spain, Corsica, southern Italy and Greece, usually near the sea; but now extensively planted in south-eastern Australia and sometimes escaping from Victorian plantation areas into the surrounding eucalypt forest (e.g. in the Creswick-Ballarat and Macedon districts).

[This variety differs from the typical form of the species in being more sparsely branched, with more flexible and less persistent leaves that rarely last longer than 3 years. The original diagnosis of *Pinus nigra* (Austrian or Black Pine), in a rare German work of 1785, seems to have escaped the notice of all 19th century botanical compilers and annotators—Willdenow, Sprengel, Steudel, Walpers etc.—and only in recent decades has the name *P. nigra* been used; A. Fiori adopted it in *Flora analitica d' Italia* 4: App. 11 (1907). Under the impression that Arnold's description and plate failed to satisfy the requirements of the *Laws of Botanical Nomenclature*—an opinion with which the present writer does not agree—A. Franco in *An. Inst. sup. Agron., Lisboa* 16: 131 (1950) took up for this taxon the earliest subsequent legitimate name, *P. clusiana* Clemente in Arias *Adic. Agric. Gen. Herrera* 2³: 404 (1818). Simultaneously he made the new combination *P. clusiana* var. *corsicana* for the Corsican Pine, now so widely grown in temperate parts of eastern Australia. But the varietal epithet *corsicana* was redundant when applied originally (by De Lamarre, later also by Loudon) under the illegitimate specific name *P. laricio* Poir. which was based upon the very same race of the species from Corsica. The oldest possible varietal epithet published for the Corsican—and the nearby coastal Italian—race of *P. nigra* is unquestionably *maritima* Ait., and this must be employed if one should desire to make a distinction from the typical or Austrian race of the species.

Several other species of *Pinus* are frequently grown in Victorian plantations, parks and gardens. In particular, *P. halepensis* Mill. (Aleppo Pine) and *P. pinea* L. (Stone Pine or Nut Pine)—both rather drought-resistant Mediterranean trees with leaves in pairs—are familiar ornamental subjects. The former is distinguished by its irregular silvery-barked branches and narrow, reddish, *deflexed*, very smooth cones 2-4" long; the latter by its peculiar, flat, umbrella-shaped crown, and longer (4-6"), *erect*, almost globular cones which bear *very large* (15-18 mm. long), dark purplish-brown seeds with sweet edible kernels.

Another gymnosperm, that has persisted for many years at two spots on the eastern shores of Port Phillip Bay (Beaumaris and North Brighton) is the curious

Mediterranean *Ephedra fragilis* Desf. *Flor. atlant.* 2: 372 (1799)—Common Joint-fir, "shrubby horsetail" or "sea grape" in the family *Gnetaceæ*. This low plant has very slender, opposite, naked, rather brittle, green branches, minute scale-leaves in distant pairs, and numerous sessile female amenta (the fruiting bracts of which become red and fleshy to form small berry-like syncarps).]

ANGIOSPERMÆ

(Flowering plants)

MONOCOTYLEDONEÆ

Family 28. TYPHACEÆ

51. TYPHA L. (1753)

119. *T. angustifolia* L. *Spec. Plant.* 2: 971 (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 37 (1943); Melvaine, *Contr. N.S.W. Herb.* 1: 92 (1940); Williamson, *Vict. Nat.* 44: 243 fig. 3 (1928); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 9 (1957); Atkinson in Abrams, *Ill. Flor. Pacific States* 1: fig. 166 (1923); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 940 (1931); Hutchinson, *Brit. flowering Plant.* fig. 141 (1948), also in *Fam. flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 392 (1959); Poincot in Bonnier *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2813, col. (1930–31); Coste, *Flor. Franc.* 3: fig. 3690 (1906); Graebner, *Pflanzenreich IV* 8 (Heft 2): fig. 2 A-B, 4 B & D (1900); Reichenbach, *Icon. Flor. germ.* 9: t. 321, col. (1847); Whittet, *Weeds* (N.S.W. Dep. Agric.) t. 61, col. (1958).

Vern.: Bulrush (Lesser Reed-mace, Cumbungi). *Distr.*: River banks, lagoons, lakes and swampy ground throughout Victorian lowlands, becoming a pest in many places (e.g. Murray R. irrigation settlements, and at Lake Wendouree, Ballarat); all Australian States, Cent. Aust., N.Z., and almost cosmopolitan.

Diagn.: Rigidly erect, semi-aquatic, rhizomic perennial to 8 ft. high; leaves to 8 ft. long and 5-10 mm. wide, narrow-linear, flat, stiff but softly textured and suitable for weaving; culms rigid, cane-like; male (uppermost) and female spikes bright brown, cylindrical, usually 4-10" long and 1-2 cm. wide, separated on the same scape by a gap of 1-3 cm. and bursting into a copious pallid floss at maturity; flowers minute, exceedingly numerous and closely packed, the male having 2-3 anthers inserted on a common filament, the female consisting of a stalked ovary with single pendulous ovule; perianths absent, but several attenuated, spatulate bracteoles on hair-like stalks subtend each flower, and tufts of long, fine, silky hairs arise from the short pedicel (\pm as a "pappus" for wind dispersal of seed); fruit a microscopic nutlet.

[A. T. Melvaine in *Contr. N.S.W. Herb.* 1: 83-91 (1940) distinguishes two Australian taxa, viz. *T. angustifolia* var. *brownii* (Kunth) Kronfeld in *Verh. zool.-bot. Ges. Wien* 39: 89 (1889) with numerous broad bracteoles, and *T. muelleri* Rohrbach in *Verh. bot. Ver. Brandenburg* 11: 67 (1869) having few narrow bracteoles; but such morphological criteria, *per se*, appear to be trifling and only a single variable species is recognized in this key, conforming to J. M. Black's opinion in *Flor. S. Aust.* ed. 2: 46 (1943). P. Graebner in *Pflanzenreich IV* 8 (Heft 2): 13 (1900) had relegated *T. muelleri* to subspecific rank under *T. angustifolia*.]

Family 29. SPARGANIACEÆ

52. SPARGANIUM L. (1753)

Inflorescence *simple or slightly branched*, with 2-4 sessile female heads; subtending floral leaves 3-5 mm. wide (lower foliage sometimes floating); ripe fruits *narrowly turbinate*, 4-6 × 2-3 mm., in heads 1-1.5 cm. wide:

120. *S. antipodum* Graebner in *Pflanzenreich IV* 10 (Heft 2): 18-19, fig. 4 B (1900).

Illust.: Graebner (*l.c.*); Williamson, *Vict. Nat.* 44: 243 fig. 4 (1928); Graff in Ewart, *Plant. indig. Vict.* t. 87 opp. 24 (1910), as "*S. stenophyllum*"; Graff in Mueller, *Vict. Nat.* 10: 195-196 (1894), as "*S. angustifolium*".

Vern.: Floating Bur-reed. *Dist.*: Marshy places along water-courses in eastern Victoria, but localized and uncommon except in the far north-east (Yarra R. near Melbourne where now very rare or extinct, Cranbourne, Ovens R., Towong, Koetong, Upper Murray R., Omeo, Benambra); N.S.W., Qd, N.Z.

[Despite P. Graebner's statement in *Pflanzenreich IV* 10 (Heft 2): 19 (1900), that the Asiatic species, *S. stenophyllum* Maxim. ex Meinsh. in *Bull. Soc. Nat. Moscou sér. 3, 1889*: 171 (1890) stands far apart ("*longe distat*") from Australasian *S. antipodum*, the two species are extremely close and some more recent specialists would fuse them. If specific identity be proved, then the older name *S. stenophyllum* must take precedence.]

Inflorescence *amply branching*, usually with *more than 4* female heads; subtending floral leaves 6-12 mm. wide (foliage never floating); ripe fruits *broadly turbinate*, 6-9 × 4-5 mm., 4- to 6-angled, pyramidal at apex, in heads 1.5-2 cm. wide:

121. *S. ramosum* Huds. *Flor. angl.* ed. 2: 401 (1778).

Illust.: Williamson, *Vict. Nat.* 44: 243 fig. 5 (1928); Ripley in Lewis, *Brit. Wild Flowers* fig. 166 (1958); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 941 (1931), as "*S. erectum*"; Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2815, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3693 (1906); Pfenniger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 15 fig. 3, col. (1907); Graebner, *Pflanzenreich IV* 10 (Heft 2): fig. 2 A-C (1900); Reichenbach, *Icon. Flor. germ.* 9: t. 326, col. (1847), as "*S. erectum*".

Vern.: Branching Bur-reed. *Dist.*: Beside rivers and creeks in south-western Victoria and rare (Portland, Hopkins R., Mt. Emu Ck, Merri R. at Warrnambool), also Orbost; N.S.W. (rare). S. Qd (rare), N. Amer., N. Afr., widespread in Europe and Asia.

[Many varieties and subspecies of *S. ramosum* have been published; but it is not at present clear to which of these subordinate categories Australian populations should be referred.

Family 30. POTAMOGETONACEÆ

53. POTAMOGETON L. (1753)

- | | |
|--|---|
| 1. Leaves all similar, <i>submerged</i> , <i>sessile</i> or nearly so | 4 |
| Upper leaves always <i>floating</i> , <i>petiolate</i> , with broad blades | 2 |

2. Floating leaves thin, *translucent*, often shining, *prominently net-veined* between the primary parallel veins; margins usually \pm crinkled when dry (fruit unknown):

122. *P. australiensis* A. Bennett in *J. Bot., Lond.* 48: 149 (1910).

Illust.: Nil.

Vern.: Thin Pondweed. *Distr.*: Apparently localized on the Merrijig tributary of Bream Ck (between Geelong and Torquay), and at Wilson Prom. (Five Mile Beach); also N.S.W.

[Originally considered by Bennett as referable to the West Indies *P. coloratus* Vahl ex Hornem., var. *jamaicensis* Griseb.]

—Floating leaves *opaque*, with *inconspicuous secondary venation*, margins even 3

3. Submerged leaves thin and membranous, oblong-lanceolate to linear, aerial leaves broadly elliptic or almost orbicular, with up to 16 parallel veins; fruits 2.5 mm. long, broadly ovoid, *smooth*, with *very short beak* and a narrow dorsal keel:

123. *P. cheesemanii* A. Bennett in *J. Bot., Lond.* 21: 66 (1883).

Illust.: Smith in Cheeseman, *Ill. N.Z. Flor.* 2: t. 206 (1914); Hutchinson, *Fam. flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 354 (1959).

Vern.: Small-fruited Pondweed. *Distr.*: Swamps, ponds, billabongs and river lagoons almost throughout Victoria; all Australian States, N.Z.

[Hitherto confused with *P. tricarinatus* (q.v.) which has very different fruits.]

—Submerged leaves thinly membranous, linear; aerial leaves ovate-oblong, to 1" wide, with up to 16 parallel veins; fruits 3-4 mm. long, *prominently beaked* and with 3 strongly *crenulate* (often tuberculate) dorsal keels:

124. *P. tricarinatus* F. Muell. & A. Bennett ex A. Bennett in *J. Bot., Lond.* 30: 229 (1892).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 41 (1943); White in Bailey, *Compr. Cat. Qd Plant.* 585 fig. 563 (1913).

Vern.: Floating Pondweed. *Distr.*: Swamps, ponds, river backwaters etc. almost throughout Victoria; all States, Cent. Aust., E. Asia.

—Submerged leaves elliptical, at least the uppermost very similar in shape and texture to the aerial leaves (1-2" wide) which have 16-24 parallel veins; fruits about 4 mm. long, *prominently beaked*, with 3 slightly crenulate-tuberculate narrow keels:

125. *P. sulcatus* A. Bennett in *Ann. naturh. (Mus.) Hofmus., Wien* 7: 294 (1892).

Illust.: Nil.

Vern.: Furrowed Pondweed. *Distr.*: Swamps, ponds, river backwaters etc. almost throughout Victoria; N.S.W., Qd, S.A.

4. Leaves *narrow-linear* and parallel-sided or almost so, >10 times as long as broad 7
 Leaves *ovate* to *linear-lanceolate* or narrowly oblong, not parallel-sided, up to 9 times as long as broad (but usually much <9) 5
5. Leaves *amplexicaul*, usually with wide cordate base, often undulate on margins, *ovate-lanceolate* to almost orbicular, 1.5-6 cm. long; fruit 3.5-4 × 2.5-3 mm., shortly beaked and obscurely keeled:

126. *P. perfoliatus* L. *Spec. Plant* 1: 126 (1753).

Illust.: Williamson, *Vict. Nat.* 44: 310, fig. 1 (1928); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 962 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2784, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3648 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 16 fig. 3, col. (1907); Reichenbach, *Icon. Flor. germ.* 7: t. 29 fig. 53-54, col. (1845).

Vern.: Perfoliate Pondweed. *Distr.*: Lakes and rivers in southern Victoria, but uncommon (Lower Glenelg R., Merri R. at Warrnambool, near Cape Otway, Lake Wellington, Tambo R.); Tas., N.S.W., Qd, Asia, N. Afr., Eur., eastern N. Amer., Central Amer.

[In addition to the round-leaved form at Tambo R., Vict., there occurs elsewhere a plant with longer, narrower and much less amplexicaul leaves: this was designated as var. *muelleri* A. Bennett in *J. Bot., Lond.* 25: 178 (1887).]

—Leaves *never amplexicaul* or stem-clasping 6

6. Leaves very shortly-stalked, oblong-lanceolate, 2-6 times as long as broad, >8 cm. long and at least 2 cm. wide; fruit 3.5 × 2.2-5 mm., very *shortly beaked* and *obscurely keeled*:

127. *P. lucens* L. *Spec. Plant* 1: 126 (1753).

Illust.: Atkinson in Abrams, *Ill. Flor. Pacific States* 1: fig. 182 (1923); Graebner, *Pflanzenreich* IV 11 (Heft 31): 77 fig. A-D (1907); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 960 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2776, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3650 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 16 fig. 4, col. (1907); Reichenbach, *Icon. Flor. germ.* 7: t. 36, col. (1845).

Vern.: Shining Pondweed. *Distr.*: Recorded for Victoria on the basis of a single collection (in Herb. Kew) from Tambo R., Feb. 1854, and doubtfully represented anywhere in Australia now; otherwise almost cosmopolitan.

—Leaves sessile, lanceolate to narrowly linear-oblong, 5-9 times as long as broad, rarely attaining 8 cm. in length and <1.5 cm. wide, the margins denticulate and ± undulate; fruit 3.5 × 2.3 mm., with *long acute beak* and 3 prominent, somewhat crenulate *dorsal ribs*:

128. *P. crispus* L. *Spec. Plant.* 1: 126 (1753).

Illust.: Miller in Eardley, *S. Aust. Nat.* 20: 7 fig. 2 (1939); Williamson, *Vict. Nat.* 44: 310 fig. 2 (1928); Fadeel in Täckholm, *Student's Flor. Egypt* t. 78 (1956); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 21 (1957); Atkinson in Abrams, *Ill. Flor. Pacific States* 1: fig. 183 (1923); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2785, col. (1930-31); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 963 (1931); Coste, *Flor. Franc.* 3: fig. 3647 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 17 fig. 1, col. (1907); Reichenbach, *Icon. Flor. germ.* 7: t. 29 n. 50, col. (1845).

Vern.: Curly Pondweed. *Distr.*: Lakes and rivers in southern and western Victoria, but scattered (Western Wimmera, Lower Glenelg R., Warrnambool, Curdie's R., Lake Colac, Melbourne Bot. Gard. lake, Wilson Prom.); S.A., N.S.W., Qd, Asia, Afr., Eur., N. Amer.

7. Leaves *not sheathing*, linear, 2-6 mm. wide, *very obtuse*; spikes elongated, with numerous closely packed flowers; fruit $3-4 \times 2-3$ mm., *prominently beaked*, not keeled but with smooth or slightly crenulate back:

129. *P. ochreatus* Raoul in *Ann. Sci. nat. (Bot.) sér. 3, 2*: 117 (1844).

Illust.: Williamson, *Vict. Nat.* 44: 310 fig. 3 (1928).

Vern.: Blunt Pondweed. *Distr.*: Swamps, ponds, lakes and river lagoons almost throughout Victoria; all states, N.Z., E. Asia.

[Often a nuisance in lakes and dams, the stems sometimes attaining lengths of 15 ft. *P. crispus* sometimes has long narrow leaves as in this species, but the denticulate leaf-margins and crenulately ribbed fruits at once distinguish it.]

—Leaves *not sheathing*, narrow-linear, 1-3 mm. wide, *acuminate* at apex; spikes with a single terminal cluster of 4-8 flowers; fruit $3-4 \times 2$ mm., *shortly beaked*, the dorsal margin narrowly keeled and \pm crenulate, the ventral bearing a small tooth toward its base:

130. *P. acutifolius* Link in Roem. & Schult. *Syst. Veg.* 3: 513 (1818).

Illust.: Williamson, *Vict. Nat.* 44: 310 fig. 4 (1928); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 966 (1931); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2789, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3645 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 61 (1907).

Vern.: Sharp Pondweed. *Distr.*: Extremely rare in Victoria and collected only once, on the "Murray River" (by F. Mueller, but without details as to locality and date); otherwise known from Asia, Eur. & N. Amer.

[It is not certain that the Australian material is truly conspecific with Link's boreal plant.]

—Leaves *sheathing* at base, narrow-linear or *almost filiform* and grass-like, 0.5-2 mm. wide, *obtuse and mucronate or acute* at apex; spikes with several isolated clusters of 2-3 flowers; fruit $3-5 \times 2-4$ mm., *very shortly beaked*, with 1-3 obscure dorsal ribs:

131. *P. pectinatus* L. *Spec. Plant.* 1: 127 (1753).

Illust.: Ewart, *Flor. Vict.* fig. 20-21 (1931); Williamson, *Vict. Nat.* 44: 310 fig. 5 (1928); Fadeel in Täckholm, *Student's Flor. Egypt* t. 78 (1956); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 14 (1957); Atkinson in Abrams, *Ill. Flor. Pacific States* 1: fig. 191 (1923); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 968 (1931); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2782, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3640 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 17 fig. 2, col. (1907).

Vern.: Fennel Pondweed. *Distr.*: Rivers, lagoons, lakes and ponds almost throughout Western Victoria (south of the Divide)—from the S. Aust. border to Yarra R., and sometimes in brackish water; all States, N.Z., and almost cosmopolitan.

[A valuable food of diving ducks in the U.S.A., where it is called Sago Pondweed.]

Family 31. POSIDONIACEÆ

54. POSIDONIA Ch. Koen. (1805)

132. *P. australis* Hook. f. *Flor. Tasm.* 2: 43 (1858).

Caulinia oceanica R. Br. *Prodr. Flor. Nov. Holl.* 339 (1810), non *Posidonia oceanica* (L.) Delile (1813).

Illust.: Crosby in Ferguson Wood, *Proc. Linn. Soc. N.S.W.* 84: 220 (1959)—two forms; Black, *Flor. S. Aust.* ed. 2: fig. 40 (1943); Williamson, *Vict. Nat.* 44: 285 fig. 4 (1928); Ostenfeld in Bowman, *Pap. Mich. Acad. Sci.* 2: t. 4 (1923); Ostenfeld, *Dansk bot. Ark.* 2^o: 32-36 fig. 17-22 (1916); Ascherson & Graebner, *Pflanzenreich IV* 11 (Heft 31): 37 fig. 12 D-E (1907).

Vern.: Fibre-ball Weed (Marine Fibre Plant). *Distr.*: Submarine, on shallow sandy sea-floor at Corner Inlet (the only definite Victorian locality, although there are credible reports of the plant in Portland waters); coasts of southern W.A., S.A., Tas. (including Bass Strait islands), N.S.W.

Diagn.: Rhizomic submarine perennial with short erect stems sparingly branched, the stem bases covered with fibrous remains of leaf-sheaths; leaves linear and ribbon-like up to 15 mm. broad and often 2-3 ft. long, streaked with numerous fine parallel veins (the mid-vein indistinct) and interrupted with irregular cross-septa; inflorescence a terminal compound spike of several bisexual flowers, subtended by a leaf-like lower bract, with shorter bracts below each secondary spike; perianth absent; stamens 3; carpel solitary, sessile, contracted toward apex, with 3-4-lobed stigma and single erect ovule; fruit \pm 2 cm. long, ovoid-acuminate, with slightly curved beak and green fleshy pericarp, opening irregularly at the base.

[In St. Vincent and Spencer Gulfs, S. Aust., the species has been exploited commercially for the sake of its fibre; balls of fibre up to the size of cricket-balls are frequently rolled by wave action onto the beaches of South and West Australia.]

Family 32. ZOSTERACEÆ

55. ZOSTERA L. (1753)

Leaves truncate, often *manifestly notched* at apex, usually <2 mm. wide; flowering spathes thin and papery; 2-3 bracteoles *present* on the flattened rhachis of spike, covering most flowers; flanks of stem internodes each with a *solitary* vascular strand; anthers 10-11, alternate:

133. *Z. muelleri* Irmisch ex Aschers. in *Linnæa* 35: 168 (1867).

Z. nana sens. Ewart *Flor. Vict.* 84 (1931), non Roth (1827).

Illust.: Crosby in Ferguson Wood, *Proc. Linn. Soc. N.S.W.* 84: 221 fig. b, d & f (1959); Williamson, *Vict. Nat.* 44: 285 fig. 1 (1928), as "*Z. nana*".

Vern.: Dwarf Grass-wrack. *Distr.*: Creeping through sand and silt in shallow sea-water and inlets around the whole Victorian coast (including Port Phillip), and often exposed in beds at low tide; temperate coasts of all States, also N.Z.

Leaves rounded or *very minutely notched* at apex, 2-4 mm. wide; spathes opaque and broadly inflated (4-5 mm. wide); floral bracteoles *absent* from the very flattened rhachis; flanks of stem internodes each with 2-5 vascular strands; anthers 20-24, in 2 packed rows:

134. *Z. tasmanica* G. V. Martens ex Aschers. in *Linnaea* 35: 168 (1867).

Illust.: Crosby in Ferguson Wood, *Proc. Linn. Soc. N.S.W.* 84: 221 fig. a & g (1959); Williamson, *Vict. Nat.* 44: 285 fig. 2 (1928).

Vern.: Tasman Grass-wrack. *Distr.*: In Victoria, exactly as for *Z. muelleri* (above); also S.A., Tas., N.Z.

Family 33. RUPPIACEÆ

56. RUPPIA L. (1753)

135. *R. maritima* L. *Spec. Plant.* 1: 127 (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 42 (1943); Miller in Eardley, *S. Aust. Nat.* 20: 7 fig. 1 (1939); Williamson, *Vict. Nat.* 44: 285 fig. 7 (1928); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 32 (1957); Atkinson in Abrams, *Ill. Flor. Pacific States* 1: fig. 192 (1923); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 957 (1931); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2796, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3661 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 17 fig. 5, col. (1907); Reichenbach, *Icon. Flor. germ.* 7: t. 17 n. 26, col. (1845).

Vern.: Sea Tassel. *Distr.*: In brackish water (near the sea) all along the Victorian coast—including streams and ponds around Port Phillip—also in saline swamps inland but absent from N.E. Victoria; all States, Cent. Aust., N.Z. and almost cosmopolitan (in U.S.A. it provides food for diving ducks and is known as wigeon-grass).

Diagn.: Slender submerged perennial often several feet long; stems filiform, repeatedly branched; leaves clustered, filiform, 2-6" long, with dilated sheathing bases which enclose the young inflorescences; flowers bisexual, 1 or 2 (on opposite faces of axis), without perianth, borne on a long filamentous axillary coiled peduncle which uncoils at anthesis so that the flower is lifted up to the surface of the water; anthers 2, sessile; carpels 4-8, at first sessile but becoming long-stalked as they ripen; fruit indehiscent, 1-seeded, ovoid, beaked and asymmetric, glabrous, 3-4 mm. long.

Family 34. ZANNICHELLIACEÆ

Plant submarine; leaves *broad-linear*, distichous, truncate at apices; male and female flowers *all sessile* and enclosed in the sheathing leaf-bases

57. *Cymodocea*

Plant of fresh or brackish water, copiously branching; leaves (and stems) *filiform*; female flowers on pedicels which, in the fruiting stage, are *exserted* well beyond leaf-sheaths

58. *Lepilana*

57. CYMODOCEA Ch. Koen. (1805)

136. *C. antarctica* (Labill.) Endl. *Gen. Plant.* 230 (1837).

Ruppia antarctica Labill. *Nov. Holl. Plant. Specim.* 2: 116 (1806), t. 264 (1807).

Illust.: Black, *Trans. roy. Soc. S. Aust.* 37: t. 1 (1913), as "*Pectinella antarctica*"; Black, *Flor. S. Aust.* ed. 2: fig. 38 (1943); Miller in Eardley, *S. Aust. Nat.* 20: 7 fig. 3 (1939); Ewart, *Flora Vict.* fig. 19 (1931); Williamson, *Vict. Nat.* 44: 285 fig. 3 (1928); Labillardière (*l.c.*).

Vern.: Sea Nymph. *Distr.*: Shallow sea-water and rock pools all around the Victorian coast; southern coasts of all States except Qd.

Diagn.: Rhizomic perennial with hard, wiry upright stems at nodes; stems 6"-2 ft. or more in length, bearing distichous leaves in upper part and numerous close-set annular scars of old leaves along the greater part; leaves broad-linear, about 3-5 cm. \times 5 mm., truncate or lunate at apices, rigid, shining, streaked with up to 20 parallel but freely anastomosing veins, often encrusted with limy algal growths; male flowers solitary, naked, enclosed in leaf-bases, with 2 coherent horned anthers; female flowers (on distinct shoots or plants) consisting of twin carpels, one often abortive, surrounded by a 4-lobed cup which attains a width of \pm 1 cm. in the fruiting stage and falls away, with the embryo plant, as an anchoring grapple of 4 curved combs (the teeth of each comb rigid and up to 5 mm. long).

58. *LEPILÆNA* Drummond ex Harvey (1855)[*Althenia* F. Petit (1829) pro parte]

1. Leaves manifestly dilated at base; perianth-segments and styles shorter than the 3 mature carpels (the segments much shorter, ovate, 1-2 mm. long); body of fruitlet oblong, flattened, \pm 2 \times 1.5 mm., tuberculate, 3-ribbed, with prominent keel, its stalk 2-3 mm. long; leaf-tip acute:

137. *L. australis* Drummond ex Harvey in *Hook. J. Bot. Kew Gdns. Misc.* 7: 58 (1855).

Althenia australis (Drummond ex Harvey) Aschers. in *Natürl. PflFam.* 2: 214 (1887).

Illust.: Williamson, *Vict. Nat.* 44: 285 fig. 5 (1928), as "*Althenia australis*".

Vern.: Austral Water-mat. *Distr.*: Localized in ponds and lagoons of far western Victoria (Norton's Ck near Wonwondah, Dimboola and along fringes of Little Desert to S.A. border), but seldom collected; S.A. (south-east), W.A.

—Leaves hardly dilated below; styles at least as long as the mature carpels; perianth-segments from almost as long to longer than mature carpels, oblong, 2.5-3 mm. long; body of fruitlet \pm cylindrical, 1-2 \times 0.3-0.5 mm., smooth or only minutely muricate, ribless, \pm shining, the stalk up to 1 mm. long 2

2. Flower almost sessile; anthers 2 (or 1) per male flower; stigmas relatively very large and broad, deeply lacerated; mature carpels \pm sessile, turgid, somewhat barrel-shaped, \pm 2 mm. long (including style-beak); leaf-tip truncate, with 3 distinct mucros:

138. *L. bilocularis* T. Kirk in *Trans. N.Z.Inst.* 28: 500 (1896).

Illust.: Nil.

Vern.: Small-fruited Water-mat. *Distr.*: Occasional in freshwater or salt lakes, river-lagoons etc. and in Victoria known only with certainty from Lake Calvert near Beac, Lake Bael Bael near Kerang, Lake Wellington and the Lower Mitchell R. in Gippsland, but probably overlooked; Tas., N.S.W., N.Z.

—Flowers distinctly pedicellate; anthers 3; stigmas oblong-clavate, entire; mature carpels shortly stalked, cylindrical, \pm 5 mm. long (including style-beak); leaf-tip acute 3

3. Stalk of female flower *no longer than sheath*; perianth-segments very *conspicuous*, whitish and *deeply bifid* at the tips, longer than body of mature carpels which *taper gradually* into the styles; stigma usually *pale*, slightly clavate, *inconspicuous*:

139. *L. preissii* (Lehm.) F. Muell. *Fragm. Phyt. Aust.* 8: 217 (1874).
Zannichellia preissii Lehm. *Plant. Preiss.* 2: 3 (1846);
Althenia preissii (Lehm.) Aschers. & Graebn. in *Pflanzenreich IV* 11 (Heft 31): 160 (1907).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 39 (1943).

Vern.: Slender Water-mat. *Distr.*: Not uncommon in lagoons, ponds and even saline marshes of western and southern Victoria (e.g. Wimmera R., Geelong, Queenscliff, Altona, Albert Park, Quail Id in Western Port, Lake Wellington); S.A., W.A.

—Stalk of female flower *exceeding sheath* (much longer in fruit); perianth-segments *inconspicuous*, minutely toothed and sometimes slightly *bifid* at the tips, about as long as body of mature carpels which *contract abruptly* into the \pm capillary styles; stigma *dark*, widely clavate and *very conspicuous*:

140. *L. cylindrocarpa* (Körnicker) Benth. *Flor. aust.* 7: 180 (1878).
Zannichellia cylindrocarpa Körnicke ex Walp. *Ann. bot. syst.* 6: 3 (1861);
Althenia preissii sens. Ewart *Flor. Vict.* 86 (1931) *pro parte, non* (Lehm.) Aschers. & Græbn. (1907).

Illust.: Williamson, *Vict. Nat.* 44: 285 fig. 6 (1928), as "*Althenia preissii*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 120 (1886), as "*Lepilæna preissii*"; Ascherson & Graebner, *Pflanzenreich IV* 11 (Heft 31): 160 fig. 36 (1907), as "*Althenia cylindrocarpa*".

Vern.: Long-fruited Water-mat. *Distr.*: In Victoria known only from brackish or saline water at a few scattered locations west of Port Philip Bay (mouth of Yarra R., Barwon R. near Geelong, near You Yangs, Lake Martin near Cressy and Nerrin Nerrin swamps near Streatham); Tas., S.A.

[*Zannichellia palustris* L. (Horned Pondweed) is almost indistinguishable vegetatively from any *Lepilæna* species, but differs in having *no perianth* to the male flowers, while its 2-8 *curved carpels* are more or less winged along one or both margins. This cosmopolitan water-plant is not uncommon in New Zealand, has been found at least once in South Australia (at Murray Bridge, Oct. 1887) and may well occur also in Victoria.]

Family 35. NAJADACEÆ

59. NAJAS L. (1753)

141. *N. tenuifolia* R. Br. *Prodr. Flor. Nov. Holl.* 345 (1810).

Illust.: Williamson, *Vict. Nat.* 44: 243 fig. 6 (1928).

Vern.: Water Nymph (Australian Naiad). *Distr.*: Very rare in Victoria, where collected only a few times from lagoons along the Murray R. (in upper and lower reaches) and in the Wimmera; all States except Tas., but chiefly in warmer northern waters, also New Caledonia.

Diagn.: Submerged (?) perennial herb up to 1 ft. long, creeping and rooting at lower nodes; leaves opposite, very narrowly linear, 1-2" long and 0.5-1 mm. wide, base sheathing, margins distantly and minutely but sharply serrulate; flowers male or female, minute and solitary in the leaf-axils (males rare, shortly stipitate, of one anther enclosed in a membranous bract; females sessile, \pm 2 mm. long, the ovary tapering into a bifid style).

Family 36. *APONOGETONACEÆ

60. *APONOGETON L. f. (1781)

142. *A. distachyus L. f. *Suppl. Plant.* 215 (1781)—ut "*A. distachyon*".

Illust.: Edwards in *Curtis's bot. Mag.* 32: t. 1293, col. (1810); Black, *Flor. S. Aust.* ed. 2: fig. 43 (1943); Hutchinson in Allan, *Bull. Dep. Sci. industr. Res., N.Z.* 83: fig. 89 (1940); Hutchinson, *Fam. flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 352 (1959); Herter, *Flor. il. Uruguay 1*: fig. 173 (1940); Rice, *Wild Flowers Cape G.H.* t. 249, col. (1951); Dixie in Marloth, *Flor. S. Afr.* 4: t. 3 fig. B, col. (1915); Coste, *Flor. Franc.* 3: fig. 3660 (1906).

Vern.: Cape Water-hawthorn (Cape Pond Lily, etc.). *Distr.*: Indigenous to S. Africa (coastal areas of Cape Province); but widely cultivated for ornament and occasionally escaping into ponds and lagoons in Victoria (Stony Ck near Lorne and Peterborough), S.A. (near Mt. Lofty), N.Z. & S. Amer.

Diagn.: Perennial water herb with tuberous root-stock; leaves long-petiolate and sometimes exceeding 18" in length, the floating blades oblong-elliptic or ovate and up to 8" \times 2"; flowers sessile and alternately distichous in a terminal bifurcate spike, sweetly fragrant; perianth segment solitary, ovate to obovate, white, fleshy, \pm 1 cm. long; carpels free, 3-6; anthers purplish, 6-12.

Family 37. JUNCAGINACEÆ [non Scheuchzeriaceæ]

61. TRIGLOCHIN L. (1753)

1. Annual plants of damp or sandy ground; scape <4" high, if taller (rarely), then the fruits mucronate or with conspicuous basal spurs (leaves often filiform, fertile carpels 3) 3

Perennial swamp or water plants with smooth, globoid or fusiform fruits; scape >4" high or, if less (in depauperate states) then the fruit neither mucronate nor with basal appendages 2

2. Leaves at least 5 mm. broad (usually much more), sometimes several feet long, ribbon-like and often *floating fan-wise* on water surfaces; raceme stout (axis to 2 cm. thick), the flowering part up to 1 ft. long with *numerous congested flowers* (up to 200); styles conspicuous, lilac, papillate, forming 6-rayed "stars" to 5 mm. wide; fruit \pm 10 \times 8 mm., all or most of the 6 carpels fertile and often spirally twisted, carpophore absent:

143. T. procera R. Br. *Prodr. Flor. Nov. Holl.* 343 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 44 B & H (1943); Williamson, *Vict. Nat.* 44: 314 fig. 1 (1928); Banks & Solander in Britten, *Ill. aust. Plant. Cook's Voy.* 3: t. 316 (1905).

Vern.: Water-ribbons. *Distr.*: Frequent in rivers, creeks, lakes and ponds almost throughout Victoria (but not in alps); all other States.

[The var. *dubia* (R. Br., *ut sp.*) Benth. *Flor. aust.* 7: 169 (1878) is chiefly tropical, but was found on the Murray R. (Vic.) between Nangiloc and Colignan in Mar. 1953; it differs from the usual form in having only 3 (rarely 4-5) carpels which are always entirely free and often stipitate when in fruit.]

—Leaves <5 mm. broad, *never floating*; raceme slender, usually with many but rather *loosely arranged and inconspicuous flowers*, the flowering part sometimes reaching 9" (diminutive forms may have only 2-3 flowers in a minute raceme); fruit $\pm 3 \times 2$ mm., 3 fertile carpels alternating with 3 barren ones, all *adhering to a carpophore or central axis*:

144. *T. striata* Ruiz & Pav. *Flor. peruv. & chil.* 3: 72 (1802).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 44 c (1943); Ewart, *Flor. Vict.* fig. 24 (1931); Williamson, *Vict. Nat.* 44: 314 fig. 2 (1928); Gleason, *New Britton and Brown Ill. Flor. N.E. United States & Canada* 1: 87 (1952); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 41 (1957).

Vern.: Streaked Arrowgrass. *Distr.*: Common in wet open places almost throughout southern Victoria (apparently absent from Mallee and alps) and a frequent component of coastal salt-marshes; all other States, N.Z., S. Afr., S.E. United States, California & tropical America.

3. Fruits without a carpophore, 3.5×1.2 mm., cylindroid, the summit an *abrupt hexagonal cone* ± 1 mm. high, the flared base with 2 deflexed or spreading thickened spurs to each carpel:

145. *T. turrifera* Ewart in *Vict. Nat.* 23: 43 (1906).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 44 κ (1943); Williamson, *Vict. Nat.* 44: 314 fig. 5 (1928); Ostenfeld, *Dansk. bot. Ark.* 2^o: t. 4 fig. 9-10 (1918).

Vern.: Turret Arrowgrass. *Distr.*: In Victoria known only from southerly parts of the Mallee and Wimmera (Little Desert, Dimboola, Bolangum, Charlton), extending to the Upper Glenelg R. around Glenisla and with an isolated occurrence at Graytown (W. from Nagambie); but almost certainly extending into South Australia, where it should be sought near Bordertown, and recorded for West Australia [*teste* C. A. Gardner, *Enum. Plant Aust. Occid.* 5 (1930)].

—Fruits adhering to a persistent central axis, neither the summit conical nor the base with deflexed spurs

4. Fruit broadly top-shaped, 2.3×2 mm., *truncate* and with 3 spreading *beaks at the summit* (racemes of 1-7 flowers, carpels united *only toward base*):

146. *T. mucronata* R. Br. *Prodr. Flor. Nov. Holl.* 343 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 44 A (1943); Williamson, *Vict. Nat.* 44: 314 fig. 3 (1928).

Vern.: Prickly Arrowgrass. *Distr.*: Not uncommon on damp saline soils of western Victoria (Little Desert, Lochiel salt lake, Mt. Abrupt, coastal salt-marshes at Geelong, Seaholme & Port Melbourne); S.A., W.A.

—Fruit oblong $<1.8 \times 1$ mm., *truncate*, each carpel winged and 6-angled on its flattened back, without basal spurs or apical beaks (raceme dense, of 10-25 flowers):

147. *T. hexagona* J. M. Black in *Trans. roy. Soc. S. Aust.* 49: 270, fig. A-E (1925).

Illust.: Black (*l.c.*), also *Flor. S. Aust.* ed. 2: fig. 45 (1943).

Vern.: Six-point Arrowgrass. *Distr.*: Apparently very localized and rare in Victoria, where known by a single collection from Lake Hindmarsh (Apr. 1895); S.A. (Barmera), Cent. Aust. (Finke R.).

—Fruit *never truncate*, cylindroid or linear-pyramidal (gradually contracting upwards), often dark-coloured, *with basal spurs* or minute points

5. Fruit 4-6 mm. long, on slender pedicels (to 5 mm.), armed at the wider base (± 1 mm. thick) with 6 *slender conspicuous* incurved or uncinat spurs (to 2 mm. long):

148. *T. calcitrapa* Hook. *Icon. Plant.* 8: t. 731 (1845).

Illust.: Hooker (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 44 G (1943); Ising, *Trans. roy. Soc. S. Aust.* 57: 184 fig. 6-9 (1933), as "*T. elongatum*"; Williamson, *Vict. Nat.* 44: 314 fig. 4 (1928); Hutchinson, *Fam. flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 349 (1959); Hooker in Buchenau, *Pflanzenreich IV* 14 (Heft 16): 13 fig. 5 (1903); Engler & Drude, *Veg. Erde* 7: 256 (1906).

Vern.: Spurred Arrowgrass. *Distr.*: Frequent on temporarily damp soil among Mallee sand-hills (e.g. extreme N.W. Victoria at Boundary Point, Kulkyn Nat. Forest, Wyperfeld Nat. Park, Lake Albacutya, Ellam, Little & Big Deserts); all States except Tasmania, extending to Cent. Aust.

[The var. *isingiana* J. M. Black *Flor. S. Aust.* ed. 2: 50 (1943), based upon *T. elongata* E. H. Ising 1933 (*non* Buch. 1903), differs in its fruit which has 2 minute deflexed spurs (connected by a membrane) *between* the 2 long incurved spurs of each carpel. Known from South and Central Australia, this variant has been collected at Ellam near Jeparit; but it may be much more widespread, and hitherto overlooked, in the Victorian Mallee (e.g. Big and Little Deserts and far north-west).]

—Fruit 2-4 mm. long, on slender pedicels (1-3 mm.), basal spurs reduced to short *inconspicuous deflexed points*:

149. *T. centrocarpa* Hook. *Icon. Plant.* 8: t. 728 (1845).

Illust.: Hooker (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 44 F (1943); Williamson, *Vict. Nat.* 44: 314 fig. 6 (1928); Ostenfeld, *Dansk. bot. Ark.* 2^o: t. 4 fig. 1-4 (1918); Hooker in Buchenau, *Pflanzenreich IV* 14 (Heft 16): 13 fig. 6 (1903).

Vern.: Dwarf Arrowgrass. *Distr.*: Widespread and frequent on damp exposed soil in western Victoria (e.g. Kulkyn Nat. Forest, Wyperfeld Nat. Park, Pink Lakes near Underbool, Big & Little Deserts, Dimboola, Black Range, Wannon Falls, Hawkesdale, Moyston, Graytown, Mogg's Ck near Anglesea), but more scattered in north-eastern region (Upper Murray); all other States, Cent. Aust.

—Fruit $\pm 1.5 \times 0.4$ mm., almost *sessile*, the basal angles with extremely *minute deflexed points*:

150. *T. minutissima* F. Muell. *Fragm. Phyt. Aust.* 6: 82 (1867).

Illust.: Williamson, *Vict. Nat.* 44: 314 fig. 7 (1928); Ostenfeld, *Dansk. bot. Ark.* 2^o: t. 4 fig. 13 (1918); Buchenau, *Pflanzenreich IV* 14 (Heft 16): 12 fig. 4 c (1903).

Vern.: Tiny Arrowgrass. *Distr.*: In Victoria scattered on damp saline ground, usually in coastal salt-marsh (Lawloit & Lochiel salt lake near Dimboola, Altona, Port Melbourne, formerly near Brighton, Sperminwhale Head); N.S.W., W.A. (probably also S.A.).

Family 38. ALISMATACEÆ

Leaves *narrowed or rounded* at base; ripe carpels *numerous* (± 20), 1-seeded, without beaks, ± 1 mm. long 62. *Alisma*

Leaves *cordate* at base; ripe carpels *few* (6-10), usually 2-seeded, long-beaked, 4-6 mm. long 63. *Damasonium*

62. ALISMA L. (1753)

151. *A. plantago-aquatica* L. *Spec. Plant.* 1: 342 (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 47 (1943); Allan, *Bull. Dep. sci. industr. Res. N.Z.* 83: fig. 84 A (1940); Williamson, *Vict. Nat.* 44: 243 fig. 2 a-b (1928); Gleason, *New Britton and Brown Ill. Flor. N.E. United States & Canada* 1: 89 (1952); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 43 (1957); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 974 (1931); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 10: fig. 2560, col. (1929); Pammel, *Man. Poison. Plant.* t. 335 (1911); Coste, *Flor. Franc.* 3: fig. 3355 (1905); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 19 fig. 1, col. (1907); Nicholson, *Ill. Dict. Gardening* 1: 47 (1884); Reichenbach, *Icon. Flor. germ.* 7: t. 57, col. (1845).

Vern.: Water Plantain. *Distr.*: Occasional beside rivers, lakes and ponds in many parts of Victoria (e.g. Lower Glenelg R., Gisborne, Goulburn R., Maribyrnong R., Yarra R., Tarra R., Lake King, Bairnsdale, Orbost), but neither in Mallee nor alps; N.S.W., S.A., N.Z., and almost cosmopolitan.

Diagn.: Perennial water herb 1-3 ft. high; rootstock bulbous; leaves \pm erect, long-petiolate, with ovate-lanceolate blades 4-12" long, 7-nerved with prominent transverse venation; scape leafless, rigidly erect, bearing a widely paniculate inflorescence (to 3 ft. tall) of whorled branches; flowers umbellate, long-stalked, pale pink; sepals 3; petals 3, fugitive, ± 5 mm. long; stamens 6; carpels ± 20 , rounded, compressed, tightly packed, 1-seeded, beakless, ± 1 mm. long when ripe.

[The specific epithet is incompletely spelt as "*plantago*" by Ewart in *Flor. Vict.* 95 (1931), Black in *Flor. S. Aust.* ed. 2: 52 (1943) and most other Australian authors. A closely related Eurasian species, *A. lanceolatum* With. *Bot. Arr. Brit. Plant.* ed. 3, 2: 362 (1796), occurs around a pond at the School of Forestry, Creswick, where it may have been accidentally imported with willow cuttings about 1930; this is distinguished from *A. plantago-aquatica* by its lanceolate leaf-blades (narrowed gradually at base), styles arising *above* the middle of fruiting carpels and anthers only about as long as broad.]

63. DAMASONIUM Mill. (1754)

152. *D. minus* (R. Br.) Buch. in *Abh. naturw. Ver. Bremen* 2: 20 (1868).
Actinocarpus minor R. Br. *Prodr. Flor. Nov. Holl.* 343 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 46 (1943); Williamson, *Vict. Nat.* 44: 243 fig. 2 a-c (1928); Ewart & Eckert in Ewart, *Plant. indig. Vict.* t. 96 opp. 33 (1910), as "*D. australe*"; H.B.S. in Mueller, *Key Syst. Vict. Plant.* 2: fig. 121 (1886), as "*D. australe*".

Vern.: Star-fruit. *Distr.*: Occasional on open marshy ground along water-courses in most parts of Victoria, except the south-west and mountain tracts (e.g. Dimboola, Yarriambiack Ck, Kulkyn Nat. Forest, Swan Hill, Avoca & Campaspe Rivers, Goulburn Valley, Upper Murray, Graytown, Skipton, Little R. near You Yangs, Yarra R., Bairnsdale, Orbost); all other States.

Diagn.: Tufted, glabrous, swamp-loving annual 6-12" high; leaves long-petiolate, with ovate-lanceolate, manifestly cordate and 3- to 5-nerved blades 2-4" long; scape leafless, bearing a stiff panicle (8-20" tall) with distant whorls of several 1-flowered branches; flowers long-stalked, pale pink; petals 3, slightly larger than 3 sepals, 2-3 mm. long; stamens 6; carpels 6-10, \pm triangular, compressed, long-beaked, united at base and radiating like wheel-spokes, 2-seeded, 4-6 mm. long when ripe.

[Also in *Alismataceæ* is *Sagittaria sagittifolia* L. (Arrow-head) which Ewart, in *Flor. Vict.* 95 (1931), records as naturalized "in swamps on the Goulburn River, near Nagambie". Confirmatory specimens are lacking from Melbourne Herbarium, and no one during the past 30 years has reported this widespread boreal plant either from Nagambie or elsewhere in Victoria. *Sagittaria* differs from *Alisma* and *Damasonium* in its sharply sagittate (arrow-shaped) leaves, unisexual flowers and numerous stamens.]

Family 39. HYDROCHARITACEÆ

1. Leaves >2 cm. long, *never* whorled 3
Leaves 1-2 cm. long, in numerous *cauline whorls* (submerged plants) 2
2. Leaves manifestly *serrulate*; stamens 3; styles 3, filiform, *undivided* 65. Hydrilla
Leaves *entire* or almost so; stamens >3; styles 3, each *lobed or notched* 64. *Elodea
3. Flower 1-2" wide, *bisexual*, with *large white petals* (leaves radical, long petiolate, with *floating* ovate to oblong blades 2-4" long) 66. Ottelia
Flower <1 cm. wide, *unisexual*, greenish, the petals *absent* or rudimentary (leaves *submerged*; rootstock rhizomic or stoloniferous) 4
4. Leaves arising in *pairs*, petiolate, with broadly *oblong to lanceolate* blades; female flowers *without* perianth, *sessile* within small axillary spathes (*marine* plant) 68. Halophila
Leaves *several* in a tuft, linear and *ribbon-like*; all flowers *pedunculate*, the female (with 3 sepals and 3 rudimentary filiform petals) rising to the water-surface on very long, capillary, *spirally coiled* peduncles (fresh-water plant) 67. Vallisneria

64. *ELODEA Michx. (1803)

153. **E. densa* (Planch.) Casp. in *Mber. Akad. Wiss. Berl.* 1857: 49 (1857).
Egeria densa Planch. in *Ann. Sci. nat. sér. 3*, 11: 80 (1849).

Illust.: Pomeroy in Mason, *Flor. Marshes Calif.* fig. 41 (1957); M.T.C. in Cabrera, *Manual Flor. Alrededores B. Aires* fig. 18 (1953); Riede, *Flora* 114: 115 (1920); Herter, *Flor. il. Uruguay* 1: fig. 189 (1940).

Vern.: Dense Waterweed. *Distr.*: Indigenous to Argentina (La Plata region); but often cultivated in aquaria and sometimes escaping into lakes, ponds, ditches etc., e.g. in a small lake at East Ringwood (Victoria), also scattered through California, Kenya etc.

Diagn.: Very leafy submerged aquatic herb, with stoutish stems 2-3 mm. thick; leaves numerous, crowded, overlapping, > 3 per whorl [cf. 3 per whorl in *E. canadensis* Michx.], linear-lanceolate, 1.5-2 cm. long, 2-5 mm. wide, very minutely serrulate; spathes narrow, bilobed, ± 1 cm. long, axillary, each with 2-3 staminate flowers that are carried aloft on a slender pedicel-like extension of the hypanthium (2-4 cm. long); sepals 3, green, oval, 3-4 mm. long; petals 3, white, 9-11 mm. long; stamens 9 (in 2 series); pistillate flowers (unknown in Victoria and California) solitary in spathe, slightly smaller than male, producing 1- to 2-seeded indehiscent fruits.

[In *Flor. Vict.* 97 (1931), Ewart states that *Elodea canadensis* is "now frequent in Victoria". There were no specimens at Melbourne Herbarium to substantiate this claim, and the only Victorian collections known to the writer are very recent ones from Lake Colac (Jan. 1961) and Crawford R. at Hotspur (Apr. 1961). North American *E. canadensis* Michx. is sometimes cultivated in aquarium tanks; it has become a pest of canals and watercourses in parts of Britain, was recorded as "common about Hobart, Jordan etc." by L. Rodway in *Tasm. Flor.* 185 (1903), and noted by E. J. McBarron (1948) as prolific in lagoons of the Murray R. around Albury, N.S.W. The species differs from *E. densa* in the much shorter leaves (7-10 mm. long), opposite or in whorls of 3, and in its smaller flowers (less than 10 mm. wide). *Anacharis* Rich. (1811) is to be regarded as synonymous with *Elodea*.]

65. HYDRILLA L. C. Rich. (1811)

154. *H. verticillata* (L. f.) Royle *Ill. Bot. Himal. Mount.* 1: 376 (1839).
Serpicula verticillata L. f. *Suppl. Plant.* 416 (1781).

Illust.: Williamson, *Vict. Nat.* 44: 241 fig. 8 (1928); Makino, *Ill. Flor. Jap.* 850 (1924); Caspari in Ascherson & Gürke, *Natürl. Pflfam.* II 1: fig. 184 A-B (1889).

Vern.: Hydrilla (Water-thyme). **Distr.:** Uncommon in Victoria where apparently restricted to the Murray R. (at Mildura, Swan Hill, Murray-Ovens confluence and Lake Moodemere near Rutherglen); S.A. (Murray only), W.A. (Cannington & Rottneid Id where perhaps an escape), N.S.W., Qd, S. & S.E. Asia, Madagascar, Mauritius, N. Afr.

Diagn.: Submerged aquatic herb; leaves in well-separated whorls of 4-8, lanceolate, distinctly serrulate, 10-15 mm. long; spathes axillary, 1-flowered, the male shorter than leaves, ovoid-spherical, beset with prickles and irregularly 2-lobed at apex, the female longer than leaves, narrowly tubular, glabrous, 2-lobed at orifice; flowers elevated on a slender "pedicel" 2-3 cm. long; female perianth-segments 6, almost equal, ± 2 mm. long, white, oblanceolate, those of male flowers similar; stamens 3; ovary cylindrical, 1-locular, with several ovules, surmounted by slender style and 3 filiform stigmas.

[The Northern European (and British) species, previously referred to *H. verticillata*, is now considered to represent a distinct species, *H. lithuanica* (Besser) J. E. Dandy—flowers have never been witnessed in Britain.]

66. OTTELIA Pers. (1805)

155. *O. ovalifolia* (R. Br.) L. C. Rich. in *Mém. Sci. math. & phys. Inst.* 12^a: 27, 78 t. 7 (1811).

Damasonium ovalifolium R. Br. *Prodr. Flor. Nov. Holl.* 344 (1810).

Illust.: Williamson, *Vict. Nat.* 44: 241 fig. 7 (1928); H.B.S. in Mueller, *Key Syst. Vict. Plant.* 2: fig. 115 (1886); Mueller, *Gdnrs' Chron.* n. ser. 25: 753 fig. 165 (1886); Richard (*l.c.*).

Vern.: Swamp Lily. *Distr.*: Widespread and rather frequent in shallow freshwater lakes, ponds and river lagoons of central and western Victoria (Beaconsfield, Yarra R., Seymour, Nathalia, Pirron Yallock, Dimboola, Glenelg R., Murray R. in far N.W., etc.), less common in north-east and apparently only near Orbost in East Gippsland; all States except Tas., Cent. Aust., N.Z.

Diagn.: Aquatic herb with linear juvenile leaves; normal leaves radical, floating, on long petioles, with ovate, or oblong and obtuse blades 2-5" long, 7-nerved and showing fainter transverse connecting veins; flower large, bisexual, solitary and sessile within a 2-lobed tubular spathe surmounting the stout peduncle (2-8" long); sepals 3, green, 2-3 cm. long; petals 3, rather longer than calyx, white and showy, obovate-orbicular; stamens 6-12, yellow, conspicuous; stigmas 6-8, each 2-lobed; seeds sausage-shaped, very numerous in a superior, 1-locular, beaked, narrowly ovoid capsule 2.5 × 1.2 cm.

67. VALLISNERIA L. (1753)

156. *V. spiralis* L. *Spec. Plant.* 2: 1015 (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 48 (1943); Ewart, *Flor. Vict.* fig. 26-29 (1931); Williamson, *Vict. Nat.* 44: 241 fig. 9 (1928); Makino, *Ill. Flor. Jap.* 850 (1924); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2770, col. (1930-1931); Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 57 (1907); Schnizlein in Ascherson & Gürke, *Natürl. PflFam.* II 1: fig. 185 (1889); Reichenbach, *Icon. Flor. germ.* 7: t. 60, col. (1845).

Vern.: Eel-weed (Eel-grass, Wild-celery—U.S.A.). *Distr.*: Widespread and scattered through lowland Victoria in ponds, rivers, streams and freshwater lagoons (e.g. Kulkyn Nat. Forest, Birch's Ck near Creswick, Brisbane Range, Melbourne, Bairnsdale); all States, N.Z., and practically cosmopolitan in tropical and warmer countries (including S. Europe).

Diagn.: Submerged aquatic herb with stoloniferous rootstock; leaves radical in tufts, linear, strap-like, ± membranous, usually 6-12" long, shortly pointed and often minutely serrulate toward apex; male and female flowers on separate plants, the former minute and extremely numerous in an ovoid head surmounting a slender but straight peduncle much shorter than leaves, the latter solitary on a very long, filiform, spirally coiled peduncle which unfolds so as to lift the flower to the water-surface (where it is fertilized by pollen from the broken-off and ultimately floating male flowers); each female flower with long-tubular spathe, 3 green sepals, 3 rudimentary petals, 3 very broad bifid ciliate stigmas, 1-locular ovary and numerous ovules; each male flower microscopic, with 3 sepals and 2-3 stamens, the whole inflorescence at first concealed in a hood-like 3-lobed spathe beneath the water.

[This genus is an important food of diving ducks in the United States.]

68. HALOPHILA Thouars (1806)

157. *H. ovalis* (R. Br.) Hook. f. *Flor. Tasm.* 2: 45 (1858).

Caulinia ovalis R. Br. *Prodr. Flor. Nov. Holl.* 339 (1810);

H. ovata Gaudich. in Freyc. *Voy. aut. Monde (Bot.)* 430, t. 40 fig. 1 (1829).

Illust.: Gaudichaud (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 49 (1943); Miller in Eardley, *S. Aust. Nat.* 20: 7 fig. 4 (1939); Williamson, *Vict. Nat.* 44: 241 fig. 6 (1928); van Steenis, *Trop. Natuur.* 22: 44 (1933); Arber, *Water Plant.* 130 (1920); Engler & Drude, *Veg. Erde* 9^t: 210 (1912); Balfour in Ascherson & Gürke, *Natürl. PflFam.* II 1: fig. 182 (1889); Balfour, *Trans. bot. Soc. Edinb.* 13: t. 8-11 (1879); Fadeel in Täckholm, *Student's Flor. Egypt* t. 77 (1956).

Vern.: Sea-wrack. *Distr.*: In shallow sea-water, probably around the whole Victorian coast but known with certainty in and near Port Phillip Bay (Sorrento, the Heads, Mud Is, Geelong) and at Wilson Prom.; all States, tropical N. Aust., Indian and Pacific Oceans.

Diagn.: Rhizomic submarine perennial herb; leaves in pairs at each node, petiolate, with oval to oblong-lanceolate blades 2-7 cm. long, prominent mid-nerves and 2 broad scarious scales at base of petioles; flowers insignificant, unisexual, solitary within a 2-leaved axillary spathe; male flowers pedicellate, emerging from spathe, with 3 minute sepals, 3 anthers and filiform pollen; female flowers sessile within spathe, lacking obvious perianth, with 1-locular, shortly beaked ovary bearing 3 long-filiform stigmas; fruit ovoid, \pm 10 mm. long, membranous, with numerous seeds.

Family 40. GRAMINEÆ [Poaceæ]

[The key to the great majority of Victorian grass genera commences on page 80 at section 15 in the left-hand margin (q.v.)]

1. Tall, erect, very broad-leaved annual; male spikelets in a large, terminal panicle; female in a lower axil, forming a thick spike (4-9" long) *encased in broad foliaceous bracts*; each ovary with a single very long style, the combined styles *forming a tassel to 6" long* 170. **Zea*
Long-creeping, stoutly rhizomic perennial of sandy coasts; male spikelets sessile, several along each aristate rhachis, all forming a loose terminal head; female solitary near base of each very long awn-like rhachis, the many spikes all composing a large, globular, *porcupine-like head to 9" wide* 161. *Spinifex*
Spikelets bisexual or, if otherwise and dissimilar, then habit and inflorescence *not* as above (ovary always with 2 styles) 2
2. Tall perennial reeds with broad leaves; culms >5 ft. high; panicles *plume-like, >6" long, erect, dense, at least the female spikelets bearing long silky hairs* 3
Much smaller grasses or, if tall, the inflorescence never as above 4
3. Culms *naked*; plants *diæcious*; leaves radical and crowded, forming a gigantic tussock, their margins sharply serrulate and cutting when handled; lemmas awned, glabrous in male plants **Cortaderia* (p. 168)
Culms leafy; spikelets bisexual; rhachilla *naked*; lemma *hairy, awned* (leaves manifestly distichous) **Arundo* (p. 168)
Culms leafy; spikelets bisexual; rhachilla *long-hairy*; lemma *glabrous, awnless* (leaves not obviously distichous) 134. *Phragmites*
4. Large perennial tussock-grass of dry inland areas; leaf-blades long, terete and *sharply needle-pointed*; inflorescence long and narrow, *far exceeding the tussock*; lemmas of the several-flowered spikelets truncate or shortly 2-lobed at summit, beset with silky hairs in the lower half 138. *Triodia*
Habit various but, if ever with pungent leaves, then inflorescence hardly exceeding the foliage and lemmas entire or the spikelets with a solitary fertile flower 5

5. Spikes bearing prickly burs composed of many *straight coalescing spines*, each involucre enclosing 1 or 2 sessile one-seeded spikelets
 158. **Cenchrus*
 Spike-like panicles bearing naked, bur-like, 1-flowered spikelets in *pedunculate pairs*; each 2nd glume convex, having 3 thick nerves *invested with hooked prickles*
 123. *Tragus*
 Spikelets neither covered with prickles *nor* enclosed in a bur-like involucre (but sometimes with 1 to several terminal awns or free basal bristles)
 6
6. Creeping grasses of coastal and saline tracts; leaves *distichous*, with inrolled, often subulate and almost *pungent-pointed blades*
 7
 Habit various but, if creeping and with distichous foliage, then the blades *never pungent*
 8
7. Spikelets *small, dark*, 1-flowered in a narrow spike-like *raceme*, *falling away intact* with the single glume; upper (inner) surface of leaf-blades faintly ribbed, with numerous smooth veins
 122. *Zoisia*
 Spikelets *minute, darkish*, 1-flowered in a short spike-like *panicle*; glumes 2, *not falling*; leaf-blades coarsely and deeply ribbed above, their protruding veins tuberculate-papillose (sometimes with scattered hairs beneath)
 133. *Sporobolus*
 Spikelets *large, pallid*, unisexual, *many-flowered*, in a short *panicle or raceme*; glumes 2, *not falling*; leaf-blades coarsely and deeply ribbed above, the protruding veins very finely papillose
 77. *Distichlis*
8. Spikelet subtended at the base by 1 to several *conspicuous bristles* which may be modified branches of the panicle or form an enveloping involucre
 9
 Spikelet *not* accompanied by bristles, but the rhachis or glumes sometimes coarsely hairy
 10
9. Bristles consisting of long *smooth hairs* (about as long as spikelet), but *not forming an involucre*; spikelets in pairs or clusters crowded along *one side of the several axes*
 148. **Echinochloa*
 Bristles several to each spikelet (rarely 1), *involucral, scabrid, persisting* on axis of the spike-like inflorescence after spikelet falls; lemma obtusish, often transversely wrinkled
 155. **Setaria*
 As for the last, but *bristles falling attached* to spikelet and the lemma acute to acuminate [inflorescence of *P. clandestinum* reduced to a cluster of 1-4 subsessile spikelets \pm hidden in the uppermost leaf-sheath]
 157. *Pennisetum*
 Bristle solitary, persistent, far longer than the acuminate spikelet; inflorescence a small but open panicle
 156. *Pseudoraphis*
10. Spikelets of one kind, sessile or nearly so along *one side of 2 to several spikes or spike-like racemes* which radiate *digitately* from the apex of the culm (windmill-like)
 11
 Spikelets *not* arranged on digitate axes or, if so, then not along one side only (whenever secund, the spike either solitary and erect or 1 to several spikes *scattered* along the main axis)
 15
11. Racemes 2; spikelet *flattened dorsally*, 1-flowered; ligule membranous; plant with long rhizomes
 154. *Paspalum*

- Racemes 3 or more; spikelet *flattened from the side*, 1- to several-flowered
(if only 1-flowered and plant rhizomic, then the ligule a ciliate rim) 12
12. Spikelets with only 1 fertile floret 14
Spikelets with more than 1 fertile floret 13
13. Axis terminating in a naked point; glumes *subequal*, *acute* or mucronate,
with prominent scabrid keel 128. *Dactyloctenium*
Axis ending in a spikelet; glumes *unequal*, *obtuse*, glabrous 127. **Eleusine*
14. Spikelet 1-flowered, *without* imperfect florets, ± 2 mm. long; lemma
awnless (perennials with *long-creeping rhizomes*) 132. *Cynodon*
Spikelet with 2 or more florets, only the lowest fertile > 2 mm. long;
lemma variously awned (tufted grasses) 131. *Chloris*
15. *Pedice*l not articulate below the glumes, which remain when the rest of the
spikelet has fallen; spikelet with 1 to many fertile flowers, \pm laterally
compressed (i.e. with *edges* of glumes flattened) or terete—dorsally
compressed only in *Isachne*, *Stenotaphrum*, *Diplachne* and *Milium* 36
*Pedice*l articulate below the outer glumes, so that the ripe spikelet falls as
a whole; spikelet with only 1 fertile flower (a 2nd lower flower may be
male or barren and then often reduced to an empty extra lemma),
 \pm dorsally compressed (i.e. with *surfaces* of glumes flattened) except in
Agrostis, *Alopecurus*, *Polypogon*, *Rhynchelytrum*, *Holcus* and *Spartina* 16
16. Spikelet dorsally compressed (if lemma awned, then inflorescence *not*
dense and spike-like) 18
Spikelet laterally compressed; glumes hairy; lemmas awned (at least one
of them in 2-flowered spikelets) 17
As for the last, but lemmas awnless (grass of tidal marshes)
**Spartina* (p. 165)
17. Glumes very unequal, the upper awned; lower infertile lemma awned,
upper awnless; panicle open, lax, with shining rosy hairs investing each
spikelet **Rhynchelytrum* (p. 207)
Glumes subequal, awnless; upper male lemma awned, lower awnless;
panicle pyramidal, \pm loose, pinkish (whole plant downy-hoary)
106. **Holcus*
Glumes equal awnless; floret solitary; lemma awned; panicle dense,
cylindroid 118. **Alopecurus*
As for the last, but glumes terminating in conspicuous fine awns
114. **Polypogon*
As for *Alopecurus*, but lemmas awnless and panicle \pm interrupted
113. *Agrostis*
18. Inflorescence a simple short dense spike; spikelet single, the glumes villose
with long soft silvery hairs (rigid grass of mallee and drier heathlands)
149. *Neurachne*
Inflorescence various but, if a dense simple spike, then the spikelets in
2's or 3's (one nearly always sessile) 19

19. Fertile lemma and palea hyaline, *thinner than glumes*; spikelets in 2's or 3's, one being sessile and often dissimilar [rarely unequally pedicellate, as in *Imperata*] 30
 Fertile lemma and palea *firmer in texture than glumes*; spikelets rarely in pairs and then quite similar 20
20. Racemes slender, *subdigitate*, with abaxial outer glume; fertile lemma with flat, thin or hyaline margins (spikelets often secund, purple or densely silky-hairy) 152. *Digitaria*
 Racemes not subdigitate or, if rarely appearing so, then either outer glume adaxial (facing the rhachis) or fertile lemma with \pm thick in-rolled margins (spikelets usually pale green or whitish) 21
21. Inflorescence a widely open, broad, and often diffuse *panicle* with capillary branches 29
 Inflorescence composed of solitary or racemosely arranged *spike-like racemes*, never an open panicle 22
22. Spikelets arranged *all around the rhachis* or irregularly, never truly secund, quite awnless 28
 Spikelets *secund* (i.e. arranged along *one* side of each rhachis) 23
23. Glumes and lemma *all awnless* 25
 Glumes or lemma awned 24
24. Leaf-blades *linear*; ligule *absent*; glumes acuminate, often purplish, with few *bristly hairs*; lemma with bold exserted awn 148. **Echinochloa*
 Leaf-blades *linear*; ligule *short, ciliate*; glumes subacuminate, pale, covered with appressed *silky hairs*; lemma with small enclosed awn 153. *Eriochloa*
 As for the last, but ligule *bold* (ciliate) and glumes *glabrous* (strongly costate) **Urochloa* (p. 207)
 Leaf-blades *short; broad-lanceolate*; ligule *short, densely ciliate*; glumes prominently awned, *bristly-hairy*; lemma awnless (trailing grass of shady humid forests) 151. *Oplismenus*
25. Lower glume *present*, at least one third the length of spikelet; spikelets rather loosely aggregated, often biconvex 27
 Lower glume *absent, or minute* and rudimentary; spikelets *densely packed* on a long narrow hairless rhachis, very flattened or plano-convex 26
26. Spikelets abaxial, *plano-convex* with the flat side facing away from rhachis, >1 mm. wide 154. *Paspalum*
 Spikelets adaxial, *flattened on both sides*, ± 1 mm. wide **Axonopus* (p. 207)
27. Outer glumes adaxial; racemes *remote*, without a terminal bristle; ligule a ciliate rim **Brachiaria* (p. 207)
 Outer glumes abaxial; racemes \pm *approximate*, terminating in a *naked bristle-point*; ligule a ciliate rim (perennials) 147. *Paspalidium*
 As for the last, but racemes *without* terminal bristle and ligule absent (annuals) 148. **Echinochloa*
28. Leaf-sheath *septate-nodulose*; racemes or panicle branches *not* bristle-tipped; outer glume minute, abaxial; lemma villose 150. *Entolasia*
 Leaf-sheath *not* nodulose; racemes terminating in a *naked bristle*; outer glume conspicuous, abaxial; lemma rugulose 147. *Paspalidium*

29. Glumes *very unequal, acute*, closely appressed; spikelet 1-flowered
 146. *Panicum*
 Glumes *subequal, blunt*, cucullate, at length gaping widely; spikelet 2-flowered (sometimes both fertile, or one male and the other female)
 159. *Isachne*
30. Fertile lemma *awned* [sometimes awnless in forms of *Sorghum halepense*]
 32
 Fertile lemma *awnless*; inflorescence dense and spike-like
 31
31. Spikelets of each pair *white and silky*, in a dense fluffy narrow panicle, unequally pedicellate; glumes never hooked (plants of dryish or sandy ground)
 163. *Imperata*
 Spikelets *green and glabrous*, in a rigid 4-rowed spike, both apparently sessile; glumes of apical spikelets often long-acuminate and *hooked at the tip* (plants of damp ground near water)
 162. *Hemarthria*
32. Spikelets in 3's, each group surrounded by a stalked involucre of 4 sterile spikelets (only the central one awned and fertile); each aggregate of 7 spikelets subtended by a *spathe-like bract*, the whole forming an interrupted leafy *nodding panicle*
 169. *Themeda*
 Spikelets in pairs (lower sessile, upper stalked), the inflorescence *not* at once bracteose and nodding
 33
33. Both spikelets fertile and awned; glumes bearing copious rusty-brown silky hairs
 164. *Eulalia*
 Only the sessile spikelet fertile and awned
 34
34. Racemes in a loose or dense panicle; spikelets *turgid and shining*
 165. *Sorghum*
 Racemes in pairs at the ends of branches or \pm digitate; spikelets *not* turgid and shining (but the vestiture may be silky-lustrous)
 35
35. Nodes *densely bearded* with long hairs; racemes digitate and sessile, often nodding, without spathes
 167. *Dichanthium*
 Nodes *glabrous* or nearly so; racemes neither truly digitate nor sessile, erect, *without spathes*
 166. *Bothriochloa*
 As for the last, but pairs of racemes each subtended by a *spathe-like bract* and often deflexed
 168. *Cymbopogon*
36. Spikelets *sessile* in \pm secund, dense, *knob-like fascicles* at intervals along a narrow spike; glumes and the 3-6 lemmas of spikelet all tapering into short awns (annual of dry country)
 130. *Elytrophorus*
 Spikelets *sessile* or very shortly-stalked, not fasciculate, arranged on *one* or *opposite* sides of the axes
 37
 Spikelets *manifestly stalked* (on the branches of loose or spike-like panicles, rarely racemes) or, if quite sessile, then disposed *all around* the primary axis
 47
37. Spikelets in two rows on *opposite* sides of the axis
 39
 Spikelets in one or more rows along *one* side of the axis only
 38
38. Spike solitary, flat and fleshy; spikelets 1-flowered, awnless, *sunk in notches* along the rhachis
 160. **Stenotaphrum*
 Spike or raceme solitary; spikelet >3 -flowered; lemma obtuse, *entire, awnless*
 75. **Catapodium*

- As for the last, but lemma *notched*, *shortly awned* at apex and flattened dorsally 125. *Tripogon*
 Spikes 1 terminal and 1-2 lateral; spikelet with 1 fertile flower; lemma acuminate, awned **Bouteloua* (p. 165)
 Spike-like *panicle* bearing two kinds of awned spikelets—sessile fertile ones with 2-4 plump lemmas, barren ones with several narrow empty glumes 83. **Cynosurus*
39. Spikelets in 2's or 3's at each node 46
 Spikelet *solitary* at each node of spike or raceme 40
40. Spikelets 2- to many-flowered, appressed to the axis or spreading from it, but *not recessed* 42
 Spikelets 1-flowered, *sunk in hollows* along the jointed fragile axis of spike 41
41. Glume single, as long as the floret; lemma awnless 93 **Monerma*
 Glumes 2, as long as floret; lemma awnless 94. **Parapholis*
 Glume single, minute; lemma awned 95. **Psilurus*
42. Spikelets on very *short stalks* in spike-like racemes, >7-flowered (lemma 7-nerved, long-awned and pectinate) 87. **Brachypodium*
 Spikelets quite *sessile* (if long-awned, then lemma 5-nerved) 43
43. Narrower *edges* of spikelets fitting into depressions along rhachis; glume single and external (spike very flattened and distichous) 82. **Lolium*
 Flattened *sides* of spikelets appressed to rhachis; glumes 2, equally developed 44
44. Tufted or rhizomic perennials, the auricles at base of leaf-blade often *caliper-like* and encircling stem; spikes usually *flattened* and *distichous*; grain tightly enclosed between lemma and palea 88. *Agropyron*
 Annuals; spikes \pm *cylindrical*; grain free between lemma and palea (cultivated cereals) 45
45. Spikelet 2-flowered; glumes *very narrow*, almost subulate, 1-nerved; lemma *narrow*, long-awned, stiffly hairy on keel 90. **Secale*
 Spikelet 2- to 5-flowered; glumes *broad*, 5- to 7-nerved; lemma *broad*, variously awned, scabrid along keel 89. **Triticum*
46. Spikelets usually in 3's (the lateral 2 reduced or barren), 1- or rarely 2-flowered (annuals) 92. **Hordeum*
 Spikelets usually in 2's, 3- to 6-flowered (stout, blue-green, rhizomic perennials of loose sand) 91. **Elymus*
47. Spikelets *variously pedicellate*, not arranged in 3's 51
 Spikelets *all sessile* (hard, rigid, awned, often in notches along a terminal spike) or, when in 3's, at least the central fertile one sessile 48
48. Glumes *unequal, dissimilar*; awn dorsal, *bent* (spikelet of several loose flowers) 99. **Gaudinia*
 Glumes *subequal, similar*; awn terminal, *straight* 49
49. Spikelets in 3's, each 1-flowered (annual) 92. **Hordeum*
 Spikelets in 2's, 3- to 6-flowered (perennial) 91. **Elymus*
 Spikelet single at the notch, 2- to 5-flowered (annual) 50
50. Glumes *very narrow* (almost subulate), 1-nerved 90. **Secale*
 Glumes *broad*, 5- to 7-nerved 89. **Triticum*

51. Glumes *plumose-hairy*, each tapering into a fine bristle; lemma with 3 slender awned lobes; panicle softly hairy, bristling with dark awns, ovoid and almost capitate (annual of sandy coasts) 116. **Lagurus*
Glumes *glabrous or shortly hairy*; panicle not as above 52
52. Spikelets *homogeneous* (panicle secund only in *Dactylis* and *Sclerochloa* which have keeled lemmas) 54
Spikelets of *two kinds*—fertile and sterile, the latter consisting of several empty lemmas (panicle often appearing secund or one-sided) 53
53. Panicle *rigid*; fertile spikelets *almost sessile*, 2- to 4-flowered; sterile lemmas *acuminate* or awn-tipped 83. **Cynosurus*
Panicle *lax*; fertile spikelets *pedicellate*, 1-flowered (long-awned); sterile lemmas *obtus*e, awnless 84. **Lamarckia*
54. Spikelet with 2-several *bisexual flowers* 77
Spikelet with 1 *fertile flower* (sometimes a male or empty flower above, sometimes 1-2 male or empty lemmas below) 55
55. Lemma distinctly 3- to *many-lobed*, or with 3-several bold awns (awns sometimes connate toward base) 73
Lemma *entire* or slightly bilobed at tip, awnless or with a single unbranched awn 56
56. Glumes *apparently* 4, the two inner being male or barren lemmas which subtend a central bisexual, fertile floret (outer glumes sometimes minute and inconspicuous) 69
Glumes 2; spikelet with single lemma (always bisexual) 58
Glumes 2; spikelet with 2 lemmas, one male and the other bisexual 57
57. Tall perennial (>3 ft.) with bulbous nodules at base; panicle large, *lax*, *shining*; spikelet compressed laterally; glumes *acute* to acuminate; lower male floret with *large twisted awn* 98. **Arrhenatherum*
Small perennial (<2 ft.); panicle small, *rigid*, *dull*, *pallid*; spikelet compressed *dorsally*; glumes *obtus*e, cucullate; both florets *awnless* 159. *Isachne*
58. Lemma *awned* (the awn sometimes minute in *Deyeuxia*) 61
Lemma quite *awnless* (but glumes sometimes awn-tipped) 59
59. Glumes *awned* and pectinate with stout hairs along keel, <5 mm. long; panicle dense, spike-like 117. **Phleum*
Glumes *awnless*, minutely scabrid, >10 mm. long; panicle dense and spike-like (robust rhizomic grass used for binding coastal dunes) 110. **Ammophila*
Glumes *awnless* <5 mm. long; if panicle spike-like, then glumes shorter or no longer than floret 60
60. Spikelet compressed *dorsally*; lemma *indurate*, smooth and shining, shorter and thicker than glumes **Milium* (p. 136)
Spikelet compressed laterally; lemma *not indurate*, as long as or longer than glumes 133. *Sporobolus*
Spikelet compressed laterally; lemma *hyaline*, thinner and shorter than glumes 113. *Agrostis*
61. Awn *dorsal*, but occasionally arising just below summit of lemma (the latter sometimes split to base of awn which appears to spring from a sinus between 2 distinct lobes); glumes *1-nerved*; callus of lemma blunt 63

- Awn entirely *terminal*, very long compared with lemma (the latter rarely with 2 minute lobes at apex); glumes 3- to 7-nerved, at least toward base; panicles diffuse to contracted but hardly spike-like 62
62. Awn *persistent*, twisted at base and usually bent or geniculate above, often massive; lemma *cylindrical*, \pm contracted at apex, the callus sharp-pointed 143. *Stipa*
- Awn *deciduous*, almost straight throughout, <1 cm. long; lemma *cylindric-ovoid*, contracted above, the callus blunt and without hair-tuft 145. **Oryzopsis*
- Awn *persistent*, slightly twisted below, otherwise straight, fine, 2-4 cm. long; lemma *obovoid*, broad and flat at summit, the bluish callus with hairtuft at least half as long as lemma 144. **Nassella*
63. Lemma entire or denticulate; awn distinctly *dorsal* 65
- Lemma 2-lobed at summit; awn *terminal*, *between the lobes* 64
64. Panicle soft and *plume-like*; awn very slender, flexuose 111. *Dichelachne*
- Panicle very *dense*, *ovoid or spike-like*; awn rigid, erect 120. *Echinopogon*
65. Glumes *swollen*, hardened and shining near base; lemma *much shorter* than glumes, with conspicuous bent awn to 4 mm. (panicle dense, contracted and spike-like) 115. **Gastridium*
- Glumes *not saccate* below; lemma *not* or only slightly shorter 66
66. Awn 10 >mm. long, *flexuose* (panicle contracted, soft, plume-like) 111. *Dichelachne*
- Awn <10 mm. long, *straight or geniculate* 67
67. Awn *straight*, 3-4 times the length of lemma which is *firmer than* and almost as long as glumes (panicle open, diffuse) **Apera* (p. 154)
- Awn <3 times as long as lemma or, if longer, then geniculate or the lemma texturally thinner than glumes 68
68. Panicle *spreading*, with capillary branches; lemma membranous, *thinner than the glumes*, usually truncate when flattened out 113. *Agrostis*
- Panicle usually *dense and spike-like*; lemma chartaceous or indurated, *thicker than glumes*, with \pm acute apices 112. *Deyeuxia*
69. Spikelets *few* in a short terminal raceme (<2" long); glumes and barren lemmas *awnless* (procumbent or climbing grasses with short scabrid leaf-blades; stamens 4) 71. *Tetrarrhena*
- Spikelets rather *few* in a loose drooping raceme or slender subracemose panicle; outer glumes minute, the inner very long with *slender scabrid awns* (palea 1-nerved; stamens 4) 70. *Microlæna*
- Spikelets *numerous*, with conspicuous outer glumes, either in loose and open or dense, erect and spike-like panicles (stamens 2, 3 or 6) 70
70. Panicle stiffly erect, *dense and spike-like*; outer glumes, or at least the upper one; *longer than* the inner sterile lemmas 72
- Panicle (or rarely raceme) *loose and open*; outer glumes *shorter than* or not exceeding the inner 2 71
71. Inner 2 glumes (or lower lemmas) enclosing male flowers; palea 1-nerved (aromatic, coumarin-scented grasses of mountain areas) 107. *Hierochloë*

- Inner 2 glumes *empty*; palea 2-nerved (non-aromatic grasses)
72. Sterile lemmas *awnless*, smaller than fertile lemma and sometimes minute; glumes *equal*, very flattened, strongly keeled and often winged (non-aromatic) 69. **Ehrharta*
109. **Phalaris*
- Sterile lemmas hairy, with long conspicuous *dorsal awns*, longer than fertile lemma; glumes *very unequal*, membranous and shining, not winged (aromatic and coumarin-scented) 108. **Anthoxanthum*
73. Lemma 3- to 9-lobed, the central lobe at least boldly awned 75
Lemma with 3 awns or a 3-branched awn (awns *never ciliate*) 74
74. Glumes <1" long, 1- to 3-nerved; awns or awn-branches equal 141. *Aristida*
Glumes >1" long, 9- to 15-nerved; central awn massive, much longer ($\pm 3''$) than the 2 fine lateral awns 142. *Anisopogon*
75. Lemma 3-lobed; panicle dense, spike-like; spikelet 1-flowered 76
Lemma 5-lobed (central lobe with long almost straight awn, lateral lobes with much shorter capillary awns); spikelet 1-flowered 121. *Pentapogon*
Lemma with 9 short rigid *plumose awns*; panicle dense, contracted; spikelet 2- to 3-flowered, but only the lowermost bisexual and fertile 135. *Enneapogon*
76. All 3 lobes of lemma terminating in ciliate awns; palea with 2 similar awns; leaf-blades *inrolled*, *setaceous* 119. *Amphipogon*
Only the central lobe of lemma awned; palea *awnless*, but minutely 3-toothed; leaf-blades *flat* 120. *Echinopogon*
77. Spikelets with several (3 or more) fertile flowers 82
Spikelets with 2 fertile flowers [rarely 3 in *Avena* and *Trisetum*—both having geniculate dorsal awns attached to upper or central third of lemma] 78
78. Lemma conspicuously *awned* 80
Lemma *awnless* 79
79. Lemmas *hard*, *indurated*, entire, *rounded*; ligule of hairs (perennial with open panicle) 159. *Isachne*
Lemmas *thin*, *truncate-denticulate*; ligule membranous (annual with open panicle) 105. **Periballia*
Lemmas *thin*, *pointed*; ligule of hairs (perennial with spike-like panicle; florets sometimes even 3 or 4) 133. *Sporobolus*
As for the last, but ligule *membranous* 101. **Koeleria*
80. Lemma with slender *apical awn* and 2 shorter lateral bristles (small delicate annual to 6") 140. **Pentaschistis*
Lemma *awned from the back* (upper to lower third) 81
81. Spikelet >1 cm. long; awns >2 cm. long; lemmas *acuminate* (tall annuals; panicle lax) 96. **Avena*
Spikelet <4 mm. long; awns <6 mm. long; lemmas *acute* (small annuals) 104. **Aira*
Spikelet 4-6 mm. long; awns <6 mm. long; lemmas *truncate* (perennial to 4 ft.; panicle open, loose) 103. *Deschampsia*

- As for the last, but lemmas *acuminate* and the dense panicle spike-like (alpine perennial) 102. *Trisetum*
82. Lemma 3-lobed or obviously notched at summit (the nerve exerted as an awn within the notch) 97
 Lemma *entire*, either awnless or shortly awned [rarely very long-awned, as in *Vulpia* and *Agropyron scabrum*] 83
83. Lemma *keeled* on the back (by a raised mid-vein) 91
 Lemma *rounded* on the back 84
84. Spikelets *nodding*, plump, very broadened, on hair-like pedicels; glumes and lemmas *awnless*, *very broad*, obtuse with hooded apices (annuals <2 ft. high) 72. **Briza*
 Spikelets *erect* or, if *nodding*, then awned or with narrow lemmas 85
85. Ligule a *ring of hairs*; lemma small, awnless, 3-nerved 129. *Eragrostis*
 Ligule *membranous*; lemma >3-nerved 86
86. Panicle *very rigid, one-sided*; pedicels of spikelets short and thick; lemmas awnless, obtusish (small annual) 75. **Catapodium*
 Panicle *rather lax* and, if ever one-sided, then lemmas long-awned; pedicels \pm slender 87
87. Glumes *very unequal*, acuminate; panicle \pm *one-sided*, contracted; lemmas very narrow, long-awned; anther 1, shortly oblong (small annuals) 81. **Vulpia*
 Glumes *subequal*; panicle regular, *not* one-sided; anthers 3, \pm linear 88
88. Lemma quite *obtuse*, *glabrous*, awnless; glumes *obtuse* 90
 Lemma *acute* or acuminate (if obtusish, then very scabrid), sometimes awned; glumes *acute* 89
89. Leaf-sheaths \pm *auriculate* at apex; styles *terminal* (perennial) 80. *Festuca*
 Leaf-sheaths *non-auriculate*; styles *lateral* to summit of ovary [annual, except *Bromus inermis*] 86. *Bromus*
90. Leaf-sheath *fused along margins*; blades lax and *flat*; lemma *entire*, with 5-9 prominent nerves (freshwater swamp or mud plants) 85. *Glyceria*
 Leaf-sheath *with margins free*; blades stiff, *inrolled*; lemma *denticulate* above, with 5 inconspicuous nerves (plants of wet saline ground) 74. *Puccinellia*
91. Ligule *membranous* 93
 Ligule a *ring of hairs* (panicle often purplish) 92
92. Lemma 7-nerved, bearing large *clavate hairs* toward base; panicle very condensed, *spike-like*, *embraced* by the uppermost leaf-sheath 76. **Desmazeria*
 Lemma 3-nerved, *glabrous* or sometimes minutely scabrid on keel (never hairy); panicle, if dense, *well exerted* beyond last leaf-sheath 129. *Eragrostis*
93. Inflorescence *not one-sided* and, if dense, then with long awns or the lemmas woolly toward base 95
 Inflorescence a *one-sided panicle*; spikelets in a compact cluster (or several clusters on slender stalks); awns, when present, very short; lemmas *not woolly* 94

94. Tall perennial grass; spikelet *scabrid*, narrowed at base; lemmas *mucronate* or very shortly awned 73. **Dactylis*
Small annual; spikelet *glabrous*, very obtuse at base; lemmas *truncate*, *awnless* 79. **Sclerochloa*
95. Lemma *obtuse* and hyaline at apex, quite awnless, often bearing long *cottony hairs* toward base; styles terminal on ovary; ligule <5 mm. long 78. *Poa*
Lemma *pointed or awned*, without cottony hairs, or, if ever obtuse or awnless (rarely), then either a giant mountain grass with ligule >5 mm. or the styles lateral to a hairy appendage surmounting ovary 96
96. Leaf-sheath \pm *auriculate* at apex; styles *terminal* (perennials) 80. *Festuca*
Leaf-sheaths *not auriculate*; styles *lateral* to summit of ovary (annuals) 86. *Bromus*
97. Glumes *longer* than and enclosing lower lemmas, often as long as whole spikelet (lemma 7-nerved or more) 103
Glumes *shorter*, or no longer, than the lowest lemma 98
98. Spikelet compressed *laterally*, purplish, in a dense feathery spike-like panicle; lemma with 3 long straight *scabrid awns* 126. *Triraphis*
Spikelet compressed *dorsally*, dark, in a loose open panicle; lemma elliptic, obtuse (\pm 4-5 mm.), with 2 short lateral lobes and a fine straight mucro between 124. *Diplachne*
Spikelet compressed *laterally*; lemma with single awn or mucro (if lateral lobes sometimes awn-like, then the central awn bent and panicle open, lax) 99
99. Lemma torn or *denticulate above*, 5-nerved, with large dorsal \pm *geniculate awn* >1 cm. long; spikelet to 7-flowered, in loose panicles 97. *Amphibromus*
Lemma *not denticulate*; awns, if >1 cm. long, straight or (rarely) curved and *not geniculate* 100
100. Lemma 5-nerved or more, awned *from just below the apex* 102
Lemma 3-nerved (or with 2 extra very short outer nerves); awn short and straight, arising *from the apical notch*; rhachilla *not villose* (small annuals) 101
101. Panicle *dense, spike-like*; glumes *subequal*; lemma acute to obtuse, not inrolled, \pm papillose-hispid 101. **Koeleria*
Panicle *loose*; glumes *very unequal* (the outer minute); lemma long-acuminate, inrolled 100. **Avellinia*
102. Spikelets <5-flowered; articles of rhachilla *villose*; awns *bent*, to 6 mm. long 102. *Trisetum*
Spikelets >5-flowered (very rarely less); rhachilla *not villose*; awns *straight* or, if curved, then >6 mm. long 86. *Bromus*
103. Lemma rather *narrow, deeply 2-lobed*, with manifest and usually bent awn between, \pm hairy (often densely so) on the back; lateral lobes often tapering into filiform points 137. *Danthonia*
Lemma *broad*, with *minute apical notch* and straight mucro; hairs present only at base of lemma or as marginal cilia 104

104. Hairs at orifice of leaf-sheath *short*; panicle *short*; spikelets plump, 4- to 6-flowered (perennial) 139. **Sieglingia*
 Hairs at orifice *long, conspicuous*; panicle *attenuated*; spikelets flat, 6- to 8-flowered (annual of inland sandy tracts) 136. **Schismus*

[The following tribal arrangement of grass genera has been adopted from that used by Lucy K. A. Chippindall in *Grasses and Pastures of South Africa*, 1955, with slight modifications according to C. E. Hubbard in *Pelican Book A 295* (Grasses), 1954—e.g. the assignment of *Bromus* to a distinct tribe *Bromeæ*, and insertion of the tribe *Glyceriæ* (segregated from *Festuceæ*).]

Tribe EHRHARTEÆ

69. *EHRHARTA Thunb. (1779)

1. Spikelet <6 mm. long; awns \pm 1 mm. long or absent (perennials) 3
 Spikelet >10 mm. long; awns conspicuous, 2 mm. long or more 2
2. Sterile lemmas almost glabrous or *sparsely scabrid* above, *much longer* than glumes, acuminate and *tapering* into awns 3-6 mm. long (annual 1-2 ft. high):

158. **E. longiflora* Sm. *Plant. Icon.* t. 32 (1789).

Illust.: Smith (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 3 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 96 (1943); *Wild Life* 4: 421, 423 (1942); Morris in Ewart, *Flor. Vict.* fig. 59 (1931).

Vern.: Annual Veldt Grass. *Distr.*: Indigenous to S. Africa; but now naturalized in W.A., S.A., N.S.W. and Victoria where scattered on moist sandy soils and sometimes abundant near towns (Melbourne district, Kellor, Torquay, Wimmera R.).

—Sterile lemmas *villose* with long white hairs, only *slightly exceeding* the glumes, *contracting abruptly* into a short awn 2-3 mm. long (sand-binding perennial 2-3 ft. high, rooting at lower nodes):

159. **E. villosa* (L.f.) Schult. & Schult. f. *Syst. Veg.* 7: 1374 (1830).

Aira villosa L.f. *Suppl. Plant.* 109 (1781).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 3 fig. D (1952); Chippindall, *Grasses & Pastures S. Afr.* fig. 4 n. 12 (1955).

Vern.: Pyp Grass. *Distr.*: Indigenous to S. Africa; but planted as a sand-binder and now naturalized in W.A., S.A. and Victoria (where at present known only from Portland district and Rainbow).

3. Glumes *purplish*, as long as the loosely *villose* sterile lemmas; upper sterile lemma *smooth* and \pm shining above, *mucronate* or very shortly awned:

160. **E. calycina* Sm. *Plant. Icon.* t. 32 (1789).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 2 fig. B, t. 3 fig. A (1952); Cook, *J. Dep. Agric. S. Aust.* 49: 542-544 (1946); Franks in Wood, *Natal Plant.* 5: t. 447 (1905); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 12 (1955).

Vern.: Perennial Veldt Grass. *Distr.*: Indigenous to S. Africa; but planted as a dry-land fodder and now naturalized in W.A., S.A., N.S.W. and Victoria where at present restricted to parts of the Wimmera (Nhill, Wail, etc.).

—Glumes and sterile lemmas *pale green*, the former manifestly *shorter* than latter; upper sterile lemma regularly and *transversely rugose* (trabeculate) above, *obtuse* and \pm cucullate at apex:

161. **E. erecta* Lam. in *Encycl. méth. (Bot.)* 2: 347 (1786).

Illust.: Franks in Wood, *Natal Plant.* 5: t. 446 (1905); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 9 (1955).

Vern.: Panic Veldt Grass. *Distr.*: Indigenous to S. Africa; but now naturalized in California, N.S.W. and Victoria (where a pest in gardens of the Melbourne district, especially on light sandy ground).

70. MICROLÆNA R. Br. (1810)

162. *M. stipoides* (Labill.) R. Br. *Prodr. Flor. Nov. Holl.* 210 (1810).

Ehrharta stipoides Labill. *Nov. Holl. Plant. Specim.* 1: 91, t. 118 (1805).

Illust.: Labillardière (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 1 fig. F-1 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 97 (1943); Morris in Ewart, *Flor. Vict.* fig. 58 (1931); Hitchcock, *Mem. Bishop Mus.* 1: 232, 233, t. 51 (1934); Turner, *Agric. Gaz. N.S.W.* 2: t. opp. 22 (1891); Mueller, *Key Syst. Vict. Plant.* 2: fig. 126 (1886), as "*Ehrharta stipoides*"; Buchanan, *Indig. Grasses N.Z.* t. 2 (1877); Fitch in Hooker f., *Flor. Tasm.* 2: t. 155 A, col. (1859), as "*M. gunnii*".

Vern.: Weeping Grass. *Distr.*: Except in the Mallee, Murray Valley plains and highest alps, a widespread and frequent grass in Victoria, inhabiting forest, heathland and open plains (of southern districts); all States, N.Z.

Diagn.: Slender rhizomic perennial; leaf-blades narrow, flat, rather short (1-3"), acute, glabrous or very slightly hairy, often widely divergent from \pm wiry stems; ligule reduced to a short hyaline rim sparingly fringed with long silky hairs; inflorescence narrow, raceme-like, 3-8" long, usually nodding gracefully; spikelets pedicellate, erect, narrow, 1-flowered, to 30 mm. long with the awns; outer glumes minute, unequal, persistent, \pm remote from lemmas; sterile lemmas rigid, scabrous, 5- to 7-nerved, with basal hairtuft, each 8-10 mm. long but tapering into a slender awn 20 mm. long or more, keeled; fertile lemma acuminate but unawned, manifestly shorter than sterile lemmas; palea shorter still, hyaline, 1-nerved; stamens 4.

71. TETRARRHENA R. Br. (1810)

1. Spikelet 8-12 mm. long; sterile lemmas ("inner glumes") *acuminate*, each with 5 prominent, raised, scabrid nerves (weak, very slender grass with distant glabrous, but minutely scabrid, leaves and hyaline hairless ligules to 1 mm. long):

163. *T. acuminata* R. Br. *Prodr. Flor. Nov. Holl.* 210 (1810).

Illust.: Nil.

Vern.: Pointed Rice-grass. *Distr.*: Damp shaded places along streams, localized and rare in Victoria (Upper Wannon R. in Grampians, Upper Goulburn R., Moe and Muddy Ck in South Gippsland, Reedy and Maramingo Cks in East Gippsland); Tas., ? N.S.W. (extreme south).

—Spikelet <6 mm. long; sterile lemmas *obtuse or truncate* (sometimes mucronate), with \pm *obscure* nervation 2

2. Stems decumbent (sometimes mat-forming), \pm *pubescent*; leaves usually *distichous*, flat or involute, with *paler upper surfaces*; spikelet usually *pubescent*; glumes \pm 1 mm. long; sterile lemmas \pm *mucronate*, the lower about half as long as upper:

164. *T. distichophylla* (Labill.) R. Br. *Prodr. Flor. Nov. Holl.* 210 (1810).
Ehrharta distichophylla Labill. *Nov. Holl. Plant. Specim. 1*: 90, t. 117 (1805)

Illust.: Labillardière (*l.c.*).

Vern.: Hairy Rice-grass. *Distr.*: Scattered through southern Victoria from the South Australian to New South Wales border, locally frequent on sandy ground in light forest (Lower Glenelg, Goræ, Black Range south from Horsham, Otways, Brisbane Range, Creswick, Frankston, Foster, Marlo, Wingan Inlet, Maramingo Ck); Tas., ? N.S.W. (far south).

[On Mt. Buffalo and in the region of Mt. Bogong is a small tufted alpine grass to about 6' high, the spikelets of which—5-6 mm. long, with *subobtuse*, scabrid, *strongly nerved* lemmas—seem to combine the features of *T. acuminata* and *T. distichophylla*. It appears to be undescribed.]

—Stems *long, tough and wiry, scabrid* with minute retrorse barbs, often copiously branching and scrambling for 20 ft. or more over gully vegetation; leaves *distant*, flat, scabrid (like the stems); spikelet *glabrous*; glumes 2-3 mm. long; sterile lemmas quite *obtuse*, rounded, the lower > half as long as upper:

165. *T. juncea* R. Br. *Prodr. Flor. Nov. Holl.* 210 (1810).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 57 (1931); Fitch in Hooker f., *Flor. Tasm.* 2: t. 154, col. (1859), as "*T. tenacissima*".

Vern.: Forest Wire Grass (Wiry Rice Grass, Tangle Grass). *Distr.*: A frequent component throughout the damp mountain-forests of Victoria, ascending from sea-level to the subalps (e.g. Lower Glenelg R., Grampians, Mt. Cole, Pyrenees, Daylesford, Mt. Macedon, Otways, Dandenongs, Kinglake, Upper Yarra Ranges, Strzelecki Range, Wilson Prom., Snowy R., Mt. Ellery, Mt. Kaye, Mt. Drummer, Upper Genoa Ranges, Howe Ranges); Tas., N.S.W.

[The var. *scabra* Benth. *Flor. Aust.* 7: 554 (1878) was based on a form from Brodribb R. (East Gippsland) having very *scabrid foliage* and the outer glumes comparatively longer than in the typical form.]

Tribe FESTUCEÆ

72. *BRIZA L. (1753)

Spikelets *rather few*, >8 mm. long and wide (usually 10-20 mm. long), silvery but often suffused with reddish- or purplish-brown, and very occasionally wholly dark purple [e.g. a population at Boronia railway station]; glumes 5-7 mm. long, 5- to 9-nerved; anthers 1-2 mm. long:

166. *B. maxima L. Spec. Plant. 1: 70 (1753).

Illust.: Gardner, *Flor. W. Aust. 1^a* (Gramineæ): t. 38 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 146 (1943); Morris in Ewart, *Flor. Vict.* fig. 79 (1931); Coleman, *Vict. Nat.* 64: t. 8 (1947); *Wild Life* 4: 420-421, 423 (1942); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 16 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 186 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 183 (1951); Herter, *Flor. il. Uruguay 1*: fig. 227 (1941); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 447 (1923); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3151, col. (1934); Coste, *Flor. Franc.* 3: fig. 4135 (1906); Reichenbach, *Icon. Flor. germ. 1*: fig. 1666 (1834); *Curtis's bot. Mag.* 10: t. 357, col. (1796).

Vern.: Large Quaking-grass (Shell Grass). *Distr.*: Indigenous to the Mediterranean region, but widely planted for its decorative appearance and now naturalized in warmer temperate parts of the whole world—Eur., Asia, Afr., N. & S. Amer., N.Z., all Australian States and in Victoria noted at Melbourne, Kinglake, Dandenongs, Frankston, Phillip Id, St. Leonards, Otways, Daylesford, St. Arnaud, Graytown, Cornishtown, Rutherglen.

—Spikelets numerous, 3-6 mm. long and wide, pale green; glumes 2-3.5 mm. long, 3- to 5-nerved; anthers <1 mm. long:

167. *B. minor L. Spec. Plant. 1: 70 (1753).

Illust.: Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 17 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 184 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 184 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 448 (1923); Herter, *Flor. il. Uruguay 1*: fig. 226 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3153, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1233 (1931); Coste, *Flor. Franc.* 3: fig. 4137 (1906); Reichenbach, *Icon. Flor. germ. 1*: fig. 1663 (1834).

Vern.: Lesser Quaking-grass (Shivery Grass). *Distr.*: Indigenous to the Mediterranean region, but now naturalized as a garden, roadside or agricultural weed almost throughout warmer temperate parts of the world—Brit. Isles, W. & Cent. Eur., Asia, Afr., N. & S. Amer., N.Z., all Australian States and in Victoria at such widely separated places as Melbourne, Frankston, Lake Mountain, Suggan Buggan, Cornishtown, Nathalia, Graytown, Brisbane Range, Otways, Glenelg R., St. Arnaud, Far North-west.

73. *DACTYLIS L. (1753)**168. *D. glomerata L. Spec. Plant. 1: 71 (1753).**

Illust.: Gardner, *Flor. W. Aust. 1^a* (Gramineæ): t. 30 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 147 (1943); Morris in Ewart, *Flor. Vict.* fig. 73 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 96 (1940); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 18 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 190 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 247 (1951); Herter, *Flor. il. Uruguay 1*: fig. 223 (1941); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 449 (1923); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3163, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1229 (1931); Coste, *Flor. Franc.* 3: fig. 4144 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur. 1*: t. 33 fig. 4, col. (1907); Reichenbach, *Icon. Flor. germ. 1*: fig. 1523 (1834).

Vern.: Cocksfoot (Orchard Grass—U.S.A.). *Distr.*: Indigenous to Europe, N. Africa and temperate Asia, but now widely naturalized as an important pasture and hay grass of temperate regions almost throughout the world—

S. Afr., N. & S. Amer., N.Z., all Australian States and in Victoria widespread and frequent in cooler districts (e.g. Lakes Entrance, Gabo Island, Frankston, Melbourne, Dandenongs, sources of Yarra R., Torquay, Otways, Mt. Macedon, Daylesford, Creswick, Stony Rises near Colac), also at Hopetoun in Mallee.

Diagn.: Densely tufted, tussock-forming perennial; leaf-blades dull green or greyish, 4-18" long, 2-12 mm. wide, flat but keeled, hairless but minutely scabrid, acuminate; ligule membranous, 2-12 mm. long; culms erect, stoutish, 1-4 ft. high; panicle erect, one-sided, 1-12" long, congested and often spike-like, roughish, green-grey to purplish; spikelets very numerous in dense masses, 5-9 mm. long, 2- to 5-flowered; glumes persistent, lanceolate, 4-7 mm. long, scabrid on keel, 1- to 3-nerved; lemmas similar but 5-nerved and shortly awned (awns 1-2 mm. long); palea almost as long and hard as lemma; anthers 3-4 mm. long.

[The var. *hispanica* (Roth, *ut sp.*) Fauché in Bory in *Expéd. sci. Mor.* 3 Bot.: 34 (1832) differs in its narrower leaves, shorter narrower very dense panicles, and in the smaller lemmas (5 mm. long) with long-ciliate margins and keels; it appeared in a lawn at Noorat near Terang (Jan. 1956).]

74. PUCCINELLIA Parl. (1848)

Spikelets very *densely clustered* in a compact narrow-oblong panicle, each 3-5 mm. long, 2- to 5-flowered and \pm *tinged with purple*; lemmas 2 mm. long or less:

169. **P. fasciculata* (Torr.) Bicknell in *Bull. Torrey bot. Cl.* 35: 197 (1908).
Poa fasciculata Torr. *Flor. nth. & middl. U.S.* 1: 107 (1823).

Illust.: Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 19 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 172 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 80 (1951); Gleason, *New Britton & Brown Ill. Flor. N.E. United States & Canada* 1: 113 (1952).

Vern.: Borrer's Saltmarsh-grass. *Distr.*: Occasional grass of coastal mud-flats and saline marshes, indigenous to W. Europe (including S. Britain), Mediterranean, S. Africa and N. America; it is common in New Zealand (where perhaps also indigenous), but in Australia would seem to be known only by two collections (Nov. 1905 & Nov. 1942) from salt-marsh at the mouth of Yarra R. (Vic.)—possibly the species is more widely distributed and has been overlooked.

Spikelets *loosely arranged*, in a panicle at first narrow and erect (later often spreading diffusely), each 6-10 mm. long, 6- to 12-flowered and wholly *pale green* or somewhat greyish; lemmas 2-3 mm. long, often loosely divergent:

170. *P. stricta* (Hook. f.) C. Blom in *Acta Hort. gothoburg.* 5: 89 (1930).
Glyceria stricta Hook. f. *Flor. N.-Z.* 1: 304 (1853);
Atropis magellanica sens. Morris in Ewart *Flor. Vict.* 165 (1931), *non* (Hook. f., *ut Catabrosa*) E. Desv. in C. Gay (1853).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 28 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 163 (1943); Morris in Ewart, *Flor. Vict.* fig. 83 (1931), as "*Atropis magellanica*"; Letty in Bews, *World's Grasses* fig. 13 (1929), as "*Glyceria stricta*"; Buchanan, *Indig. Grasses N.Z.* t. 41 A (1880), as "*Glyceria stricta*"; Fitch in Hooker f., *Flor. Tasm.* 2: t. 162 B, col. (1859), as "*Glyceria stricta*".

Vern.: Australian Saltmarsh-grass (Marsh Grass). *Distr.*: Frequent on sandy inundated ground in coastal saltmarshes, against brackish water or around salt lakes of inland places in Victoria (Mallacoota Inlet, Marlo, Tooradin, Melbourne, Altona, Geelong, Anglesea, Colac, Swan Hill, Lake Hindmarsh, Lochiel near Dimboola, Lake Walla-walla in Far North-west); all States except Qd, also N.Z.

[The recording for Victoria by Morris in Ewart's *Flor. Vict.* 165 (1931) of *Atropis magellanica* (Hook. f.) E. Desv. in C. Gay, the correct name for which is now *Puccinellia magellanica* (Hook. f.) L. Parodi (1937), was the result of a mis-identification by A. S. Hitchcock at Washington (D.C.) in 1912. The specimen concerned—from near Geelong, ex *Herb. H. B. Williamson* No. 1426—is undoubtedly referable to *P. stricta*, with spikelets very different from those of the true Chilean *P. magellanica*, and Hitchcock's mistake is astonishing.]

75. *CATAPODIUM Link (1827)

171. **C. rigidum* (L.) C. E. Hubbard in Dony *Flor. Bedfordsh.* 437 (1953).

Poa rigida L. *Cent. 1 Plant.* 5 (1755);

Festuca rigida (L.) Raspail in *Ann. sci. nat. (Bot.)* 5: 445 (1825).

Illust.: Gardner, *Flor. W. Aust. 1^a* (Gramineæ): t. 28 fig. A (1952), as "*Scleropoa rigida*"; Black, *Flor. S. Aust.* ed. 2: fig. 167 (1943), as "*Scleropoa rigida*"; Chippindall, *Grasses & Pastures S. Afr.* fig. 20 (1955), as "*Scleropoa rigida*"; Sampson in Hubbard, *Pelican Book A* 295: 180 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 76 (1951), as "*Scleropoa rigida*"; Herter, *Flor. il. Uruguay 1*: fig. 207 (1941), as "*Scleropoa rigida*"; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3161, col. (1934), as "*Scleropoa rigida*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1239 (1931), as "*Poa rigida*"; Coste, *Flor. Franc.* 3: fig. 4141 (1906), as "*Scleropoa rigida*"; Hegi, *Ill. Flor. Mittel-Eur. 1*: t. 36 fig. 4 (1908), as "*Scleropoa rigida*".

Vern.: Fern Grass (Rigid Fescue, Hard Poa). *Distr.*: Indigenous to W. & S. Europe, N. Africa and W. Asia on dry banks, walls, open stony and sandy places; introduced into N. & S. America, S. Africa and Australia (where scattered through all States, except Qd?), and widespread but hardly common in Victoria (e.g. Gabo Id, Corner Inlet, Queenscliff, Torquay, Creswick, Horsham, Warracknabeal, Rainbow).

Diagn.: Tufted glabrous annual, 2-12" high; leaf-blades to 4" long and to 2 mm. wide, acuminate, flat or inrolled; ligule blunt, membranous, 1-3 mm. long; culms slender, rigid, 2- to 5-noded; panicle ovate to linear, to 3" long, stiff, one-sided and often flattened; spikelets 4-10 mm. long, 3- to 10-flowered, often purplish; glumes \pm equal, to 2 mm. long, pointed, 1- to 3-nerved; lemma obtuse, 2-3 mm. long, 5-nerved; palea equal; anthers \pm 0.5 mm. long, narrowly oblong.

76. *DESMAZERIA Dumort. (1823)

172. **D. acutiflora* (Nees) W. B. Hemsley *Bot. Challenger Exped. 1²*: 91, t. 51 fig. 9-12 (1884)—ut "*Demazeria*".

Brizopyrum acutiflorum Nees *Flor. Afr. aust. 1*: 371 (1841).

Illust.: Hemsley (*l.c.*); Morris in Ewart, *Flor. Vict.* fig. 78 (1931).

Vern.: Desmazeria. *Distr.*: Indigenous to the coast region of Cape Province (S. Afr.) where localized and uncommon; naturalized in South Australia (near Kingston) and on low-lying silty ground in several parts of Victoria (Melbourne, Graytown, St. Leonards, Ballarat, Creswick, Castlemaine, Bendigo, Upper Glenelg R. at Cherry Pool, Wannon R. near Hamilton).

Diagn.: Stiff, rather harsh, tufted, glabrous perennial; leaves chiefly basal, the blades to 6" long and to 2 mm. wide, narrowly linear, acute, often setaceously convolute and becoming filiform, hairless beneath but \pm scaberulous above; ligule a ring of hairs; panicle dense and spike-like, \pm cylindric, 1-2" long, tawny-greenish, its base embraced by the upper leaf-sheath, borne on 4- to 5-noded culms 6-12" high; spikelets 4-5 mm. long, 5- to 8-flowered; glumes ovate-lanceolate, 3-4 mm. long, glabrous, 3- to 5-nerved; lemma lanceolate, mucronate-acuminate, 3-4 mm. long, 7-nerved, with conspicuous papillate or clavate cilia along keel and near margins in the lower $\frac{1}{4}$ or $\frac{1}{2}$; palea broad, 2 mm. long; anthers minute, 0.2-0.4 mm. long.

77. DISTICHLIS Raf. (1819)

173. *D. distichophylla* (Labill.) Fassett in *Rhodora* 27: 71 (1925).

Uniola distichophylla Labill. *Nov. Holl. Plant. Specim.* 1: 21, t. 24 (1805);

D. spicata sens. Morris in Ewart *Flor. Vict.* 145 (1931), non (L.) Greene (1887).

Illust.: Labillardière (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 158 (1943), as "*D. spicata*"; Morris in Ewart, *Flor. Vict.* fig. 69 (1931), as "*D. spicata*"; Maiden, *Agric. Gaz. N.S.W.* 8: t. opp. 520 (1897), as "*D. maritima*"; Maiden, *Manual Grasses N.S.W.* t. opp. 169 (1897), as "*D. maritima*".

Vern.: Australian Salt Grass. *Distr.*: Frequent on saline sandy ground, and often in salt-marshes, along almost the whole coast-line of Victoria (e.g. Cape Conran, Lakes Entrance, Alberton, Wilson Prom., Phillip Id, shores of Port Phillip Bay, Queenscliff, Torquay, Anglesea, mouths of Curdie's & Hopkins Rivers) and around salt lakes and pans of the Mallee (Little Desert, Dimboola, Wyperfeld Nat. Park, Far North-west); S.A., Tas., N.S.W., ? Qd.

Diagn.: Rigid perennial with long-creeping rootstocks and prostrate or ascending stems 3-6" long; leaves usually strongly distichous in 2 opposite rows, often crowded, rigid, pungent-pointed, glabrous, \pm subulate, often widely spreading, with short blades about 1-2" long; ligule a minute rim with hair-tufts at each extremity; spikelets very flattened, straw-coloured, unisexual, 2-4 together in male inflorescences, often more numerous in female, often crowded, 10-16 mm. long, 3-6 mm. broad, 6- to 14-flowered; glumes and lemmas 4-6 mm. long, closely imbricate, keeled, unawned, many-veined; anthers in male flowers 3 mm. long; stigmas in females conspicuously protruding from glumes.

78. POA L. (1753)

- | | |
|--|---|
| 1. Ligule conspicuous, >1 mm. (usually 2-5 mm.) long | 6 |
| Ligule very short, <1 mm. long (all perennial plants) | 2 |
| 2. Plants with rhizomes or creeping rootstocks | 4 |
| Plants tufted, not rhizomic | 3 |
| 3. Panicle \pm dense, 4-12" long, pale green to straw-coloured, the branches in whorls of 3-5; lemma 4-5 mm. long, narrow, \pm pubescent (coastal grass with glabrous, involute leaves as long as culms, 1-3 ft.): | |
174. *P. poiformis* (Labill.) Druce in *Rep. bot. (Soc.) Exch. Cl. Manchr* 1916: 640 (1917).
- Arundo poaformis* Labill. *Nov. Holl. Plant. Specim.* 1: 27, t. 35 (1805);
- P. billardieri* Steud. *Synops. Plant. Glumac.* 1: 262 (1854).

Illust.: Labillardière (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 160 (1943).

Vern.: Blue Tussock Grass. *Distr.*: Scattered along the Victorian coast (e.g. Gabo Id, Corner Inlet & Wilson Prom., Warrnambool), but exact distribution not yet assessed owing to confusion with forms of *P. australis*; Tas. (common on coasts), S.A., W.A.

—Panicle becoming very loose, green or purplish, on slender but stiff erect culms, most panicle-branches arising in pairs (or, if in whorls of 3-5, then plant not coastal and leaf-blades flat); lemma 2-3.5 mm. long (leaves highly variable, glabrous or hairy, flat or involute, but usually with rather stiff blades shorter than culms):

175. *P. australis*, sp. agg.

P. australis R. Br., *P. affinis* R. Br., *P. laevis* R. Br., *P. plebeia* R. Br.—omnia in *Prodr. Flor. Nov. Holl.* 179 (1810);

P. caespitosa sens. lat. Morris in Ewart *Flor. Vict.* 162 (1931), atque Benth. *Flor. aust.* 7: 651-2 (1878), non certe Forst. f. ex Spreng. (1807), nec. Poir. (1804).

Illust.: E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 78 (1923), as "*P. caespitosa*"; Wills in Turner, *Agric. Gaz. N.S.W.* 4: t. opp. 524 (1893), as "*P. caespitosa* var. *latifolia*"; Buchanan, *Indig. Grasses N.Z.* t. 47 (1880); Bacchus, *Annu. Rep. Dep. Agric. Vict.* 2: t. 2 (1874).

Vern.: Tussock Grass (Tussock Poa). *Distr.*: Widespread and frequent throughout Victoria (including Mallee, coast and alps); all States, N.Z.

[Ever since the appearance of Bentham's *Flora Australiensis*, Vol. 7 (1878), the name *Poa caespitosa* has been loosely applied to populations of tussock grasses in Victoria, showing extreme variations in size, foliage, inflorescence and degree of hairiness—even on the Bogong High Plains (5-6000 ft.) at least four distinct alpine entities can be recognized in this complex, differing in length, width, colour, rigidity and degree of involution of the leaf-blades; these are known by such popular names as "horny, ledge and silver grass". In far eastern coastal areas is another population with excessively small, pale spikelets. The whole group requires critical study, reinforced with genetical information, before a satisfactory division into species is possible. For this key, R. Brown's name *P. australis* is used in an aggregate sense; it had already been adopted by J. M. Black in *Flor. S. Aust.* ed. 2: 123 (1943) and by C. A. Gardner in *Flor. W. Aust.* 1¹ (Gramineæ): 108 (1952). It is uncertain whether G. Forster's *Poa caespitosa* (type from New Zealand) occurs in Australia at all; but, in any event, this name is rendered illegitimate by Poirét's validly published and earlier-described *P. caespitosa* (1804) from France.]

—As for the last, but culms and leaf-blades very slender (<1 mm. wide), lax and weak, the latter glabrous and involute; spikelets 2-4 mm. long, with 2-4 (rarely 5) flowers, pale green, on ± distant capillary pedicels (grass of damp shaded places):

176. *P. tenera* F. Muell. ex Hook. f. *Flor. Tasm* 2: 124 (1858), t. 164 A, col. (1859).

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Slender Tussock Grass. *Distr.*: Moist, ± shaded places in forest land throughout southern and eastern Victoria (e.g. Mt. Drummer, Wigan Inlet, Ram Head, Harrietville, Wilson Prom., Arthur's Seat, Upper Yarra Ranges, Dandenongs, Kinglake Nat. Park, Brisbane Range, Grampians, Black Range, Lower Glenelg R.); N.S.W., Tas., S.A.

4. Leaf-blades all <4" long, *bluish or grey-green, rigid*, \pm incurved, with hooded (boat-shaped) apex; culm wiry, \pm *flattened (elliptical in section)*; panicle *short* (seldom to 2" long), stiff and rather dense, the branches arising in pairs:

177. **P. compressa* L. *Spec. Plant.* 1: 69 (1753).

Illust.: E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 76 (1923); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 170 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 120 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 457 (1923); Herter, *Flor. il. Uruguay 1*: fig. 211 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3138, *col.* (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1242 (1931); Coste, *Flor. Franc.* 3: fig. 4104 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 34 fig. 1, *col.* (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1636 (1834).

Vern.: Flattened Meadow-grass (Canada Blue-grass). *Distr.*: Indigenous to greater part of Europe (including Britain) and S.W. Asia; introduced into N. & S. America, N.Z., Tas., N.S.W. and Victoria where occasional on waste ground and in damp places (Creswick, Dimboola).

—Leaf-blades mostly >4" long, pale or dark green, *not rigid*; culm *never flattened (circular in section)* 5

5. Culms *erect*, slender or stout, to 3 ft. high; leaf-blades *flat* or slightly involute, 2-4 mm. broad, the apices *hooded or boat-shaped*; panicle-branches in *whorls* of 3-5 (extensively rhizomic grass):

178. **P. pratensis* L. *Spec. Plant.* 1: 67 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 31 (1952); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 74 (1923); E. F. P., *J. Dep. Agric. S. Aust.* 50: 398 (1947), *l.c.* 10: 606 (1907); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 166 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 132 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 465 (1923); Herter, *Flor. il. Uruguay 1*: fig. 212 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3140, *col.* (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1243 (1931); Coste, *Flor. Franc.* 3: fig. 4106 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 34 fig. 5, *col.* (1907); Reichenbach, *Icon. Flor. germ.* 1: t. 88 (1834).

Vern.: English Meadow-grass (Kentucky Blue-grass). *Distr.*: Indigenous throughout Europe and temperate Asia; introduced into S. Africa, N. & S. America, N.Z., Tas., N.S.W., S.A., W.A. and Victoria where valued as a lawn grass on alkaline soils but widespread as a weed, chiefly in cooler districts (Maryborough, Creswick, Graytown, Nathalia, Torquay, Melbourne, Frankston, Dandenongs, Corner Inlet, Barry Mtns. etc.).

—Culms very slender, *weak* and often \pm *decumbent*; leaf-blades quite *involute* and almost setaceous, <1 mm. wide; lower panicle-branches in *pairs* (variably stoloniferous, each stolon bearing *tufts of leaves at the nodes*):

P. tenera F. Muell. ex Hook. f. [See No. 176].

[Most probably *P. humifusa* J. M. Black in *Trans. roy. Soc. S. Aust.* 66: 248 (1942)—from scrubs near Mt. Gambier and Keith, S. Aust.—is referable to this stoloniferous form of *P. tenera*.]

6. Stems with *bulbous swellings* at the base (perennials) 11
 Stems *not* bulbous at base; leaves flat or almost so 7
7. *Annuals* <1 ft. high; culms circular in section (lemma silky-hairy on lower half, with 5-9 conspicuous nerves) 10
Perennials, ± rhizomic, either >1 ft. high or the culms elliptical in section; foliage often grey-green or bluish 8
8. Panicle *loose*, ± pyramidal, green or purplish, 1-4" long, its branches in *whorls* of 3-5; spikelet <6 mm. long; ligule <3 mm. long:

**P. pratensis* L. [See No. 178].

—Panicle *very loose*, ± pyramidal, pale yellow-green, 4-12" long, its branches *slender*, all or most arising in *distant pairs* (the lowermost occasionally in a whorl of 3); spikelet 6-10 mm. long, with 4-10 strongly nerved lemmas; ligule 3-5 mm. long (grass of inland swampy tracts, 1-3 ft. high):

179. *P. fordeana* F. Muell. *Fragm. Phyt. Aust.* 8: 130 (1873).

Glyceria fordeana (F. Muell.) Benth. *Flor. aust.* 7: 657 (1878);

Poa hackeli F. M. Reader in *Vict. Nat.* 23: 89 (1906).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 84 (1931); Wills in Turner, *Agric. Gaz. N.S.W.* 4: t. opp. 413 (1893)—both as "*Glyceria fordeana*".

Vern.: Forde Poa. *Distr.*: Occasional on swampy or seasonally inundated ground in northern and western Victoria (Nathalia, Minyip, Warracknabeal, Little Desert, Wyperfeld Nat. Park); also moist loamy soils of inland N.S.W., Qd, S.A.

—Panicle rather *dense*, ± contracted, often with purplish tints, <4" long (usually 1-2"); panicle-branches *short*, mostly erect, arising in *pairs* or sometimes singly; spikelet usually <6 mm. long (culms 6-18" tall) 9

9. Culm *flattened*; leaf-blades <3" long, rigid, dull (± whitish); glumes 2-3 mm. long:

**P. compressa* L. [See No. 177].

Culm *terete* (circular in section); leaf-blades >3" long (almost *as long as culm*), lax, shining; glumes 4-5 mm. long, *very broad*, almost enclosing the plump spikelet (rare alpine grass):

180. *P. saxicola* R. Br. *Prodr. Flor. Nov. Holl.* 180 (1810).

Illust.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 164 B, col. (1859).

Vern.: Rock Poa. *Distr.*: Localized and rare in Victoria where known by a single collection (Jan. 1949) from the Cobboras Mts, near the border of New South Wales at 5-6000 ft.; also N.S.W., Tas. ("most mountain summits"—*teste* Rodway, 1903).

10. Panicle *loose*, pyramidal, the branches *spreading*, rather numerous and often in *pairs* on culm; spikelets *pedicellate*, <6 mm. long, with 3-6 flowers; lemma 5-nerved; anthers <1.5 mm. long:

181. *P. annua L. *Spec. Plant.* 1: 68 (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 162 (1943); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 77 (1923); Atkinson in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 101 (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 22 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 144 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 119 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 453 (1923); Herter, *Flor. il. Uruguay* 1: fig. 209 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3145, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1241 (1931); Coste, *Flor. Franc.* 3: fig. 4122 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 21 fig. 1-13, t. 34 fig. 3, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1621 (1834).

Vern.: Annual Meadow-grass (Goose Grass, Winter Grass, Annual Poa). *Distr.*: Indigenous throughout Europe and temperate Asia, perhaps also in parts of N. America; introduced into western U.S.A., S. Amer., S. Afr., N.Z., all Australian States, and frequent as a garden, lawn, pasture or wayside weed throughout Victoria (Mallee, coast, lowland plains, alps etc.).

—Panicle *dense*, often spike-like, with few short *erect* branches (arising singly); spikelets almost *sessile*, erect, 6-10 mm. long, with 6-10 flowers; lemma prominently *pleated* with 7-9 nerves; anthers \pm 2 mm. long:

182. P. fax J. H. Willis & A. B. Court in *Muelleria* 1: 45 (1956).

P. lepida F. Muell. *Fragm. Phyt. Aust.* 8: 130 (1873), *non* Nees ex Steud. (1854), *nec*. Rich. (1851).

Illust.: Nil.

Vern.: Scaly Poa (Scaly Meadow-grass). *Distr.*: Occasional on light sandy soils of S.W. and N.W. Victoria (e.g. Warrnambool district, Port Fairy, Lower Glenelg R. where frequent in open country, Far North-west); N.S.W., S.A., W.A.

11. Basal swellings tuberiform, consisting of 1-4 *superposed globular nodules*; panicle *loose*, >3" long, with slender capillary branches; spikelets *quivering* as in Quaking-grass (*Briza* spp.), 5-7 mm. long and broad, with widely spreading, very broad and obtuse lemmas (desert grass 1-2 ft. high):

183. P. drummondiana Nees in Hook. *Lond. J. Bot.* 2: 418 (1843).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 31 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 161 (1943).

Vern.: Knotted Poa (Knotted Meadow-grass, Shaking-grass). *Distr.*: In Victoria confined to the Mallee on sandy soils and rare (Kulkyne Nat. Forest, Wyperfeld Nat. Park, Little Desert, Swan Hill); ? N.S.W., S.A., W.A.

—Basal swellings *elongated*, consisting of the enlarged lowest leaf-sheaths; panicle *dense*, <3" long, with short crowded branches; spikelets *rigid*, <5 mm. long and longer than broad (sometimes all viviparous); lemmas *pointed*, not spreading:

184. *P. bulbosa L. *Spec. Plant.* 1: 70 (1753).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 146 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 150 (1951); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3142, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1248 (1931); Coste, *Flor. Franc.* 3: fig. 4115 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1619 (1834).

Vern.: Bulbous Meadow-grass (Bulbous Blue-grass). *Distr.*: Indigenous to W. Europe and the Mediterranean region; introduced into N. America and all Australian States except Tas. (?), scattered through northern and western Victoria on dryish sandy ground (Serviceton, Little Desert, Dimboola, St. Arnaud, Graytown, Cornishtown, Maribyrnong R. near Keilor).

[The widespread boreal *Poa nemoralis* L. (Wood Poa) has been recorded for Victoria on the basis of a doubtful specimen from C. Walter's herbarium labelled "Goulburn, 1902"; but, although Morris in Ewart's *Flor. Vict.* 164 (1931) remarks "now widely spread", there are no substantiating Victorian specimens in Melbourne Herbarium, nor has the writer observed this grass anywhere in the State. Boreal *P. alpina* L. (Alpine Poa) falls into the same category—no Australian-grown specimens exist in Melbourne Herbarium, despite Morris's statement (*l.c.*) "found in N.E. and E. Victoria". Two other widely distributed Northern Hemisphere species, *P. palustris* L. (syn. *P. serotina* Ehrh.), Swamp Poa, and *P. trivialis* L. (Rough Poa), have been cultivated here occasionally, but do not seem to have become truly naturalized; the latter tall perennial grass appeared in abundance over a 6-acre paddock at Warragul in Oct. 1957, and may be distinguished by its very numerous small spikelets on panicle-branches in whorls of 3-7, the rough sheaths bearing elongated ligules (4-10 mm.). The New Zealand *P. colensoi* Hook. f. (a small whitish plant) appeared around Lake Omeo in Dec. 1944—presumably introduced with grass seed from New Zealand.]

79. *SCLEROCHLOA Pal. Beauv. (1812)

185. **S. dura* (L.) Pal. Beauv. *Ess. Agrost.* 98, t. 19 fig. 4 (1812).

Cynosurus durus L. *Spec. Plant.* 1: 72 (1753).

Illust.: Palisot de Beauvois (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 164 (1943); Morris in Ewart, *Flor. Vict.* fig. 82 (1931); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 107 (1951); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3136, col. (1934); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 33 fig. 6, col. (1907); Coste, *Flor. Franc.* 3: fig. 4093 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1516 (1834).

Vern.: Hard Meadow-grass. *Distr.*: Indigenous to the Mediterranean region, Balkans, S. Russia and W. Asia; introduced in western U.S.A., N.Z. (chiefly near harbours), S.A. and Victoria where occasional on waste ground at Donald, Kalkee & Vectis East in the Horsham district and Warracknabeal—doubtless more widespread but overlooked.

Diagn.: Small stiff glabrous annual to 5" high; leaf-sheaths broad, covering stems up to base of panicle; leaf-blades flat, 1-4" long, 1-3 mm. wide, broadly acute; ligule ovate-oblong, 1-2.5 mm. long; panicle dense and \pm spike-like, unilateral, flattened, 1-2" long; spikelet 7-10 mm. long, 3- to 5-flowered, narrow, rigid; lower glume 2-3 mm. long and 3-nerved, upper glume 4-5 mm. long and 7-nerved, both very obtuse and with wide hyaline margins; lemma narrow, 6-7 mm. long, truncate and \pm emarginate at apex, hard, with 5 rib-like nerves; palea \pm equal, hard; anthers 1-1.5 mm. long; grain oblong, tapering into a bifid beak.

80. FESTUCA L. (1753)

1. Leaf-blades flat, 3-20 mm. wide (robust perennials with culms 2 ft. high or more) 5
- Leaf-blades tightly involute and \pm terete (if ever slightly flattened, then only up to 1 mm. wide) 2

2. Lemma acuminate, tapering into a *distinct awn* 1-4 mm. long 4
 Lemma acute and *awnless*, or apically truncate with a minute awn between the lobes 3
3. Panicle dense and *spike-like*, rigidly *erect*, *yellowish*, slightly or not exserted beyond upper sheath; glumes broad, 9-12 mm. long; callus \pm glabrous; anthers 5-7 mm. long (tall maritime grass with \pm pungently pointed leaf-blades to 18" long):

186. *F. littoralis* Labill. *Nov. Holl. Plant. Specim. 1*: 22, t. 27 (1805).

Illust.: Labillardière (*l.c.*); Gardner, *Flor. W. Aust. 1^a* (Gramineæ): t. 26 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 165 (1943); Morris in Ewart, *Flor. Vict.* fig. 76 (1931); Buchanan, *Indig. Grasses N.Z.* t. 55 (1880).

Vern.: Coast Fescue. *Distr.*: Widespread and rather frequent on the Victorian coast, often colonizing sand-dunes (Ram Head, Cape Conran, Coringle, Wilson Prom., French I., Queenscliff, Barwon Heads, Cape Otway, Warrnambool, Lower Glenelg R.); coasts of all States but not in tropics, N.Z.

—Panicle *spreading*, *loose*, often \pm *nodding*, green or with purplish tints long-exserted; glumes 5-8 mm. long; lemma *acute*, *awnless*; callus almost *glabrous*; anthers 4-5 mm. long (subalpine grass to 5 ft. high, the long leaf blades sometimes attaining 18"):

187. *F. muelleri* J. W. Vickery in *Contr. N.S.W. Herb. 1*: 9 (1939).

Illust.: Wills in Maiden, *Manual Grasses N.S.W.* t. opp. 183 (1898), also in *Agric. Gaz. N.S.W. 7*: t. opp. 195 (1896)—both as "*Schedonorus hookerianus*".

Vern.: Alpine Fescue. *Distr.*: Scattered on rocky terrain through subalpine mountains of eastern Victoria (Mts. Torbreck, Buller, Cobbler, Ellery, Buffalo & Wellington, Cobboras and Dargo High Plains), but seldom above 5000 ft. and apparently absent from the Bogong-Feathertop-Hotham region; also N.S.W., as far north as Barrington Tops (4000 ft.).

—As for the last, but lemma *truncate and eroded* at apex, the keel prolonged into a *minute awn* (<1 mm. long) and callus with a conspicuous *tuft* to *hairs* (usually montane grass, the leaves not exceeding 10"):

188. *F. eriopoda* J. W. Vickery in *Contr. N.S.W. Herb. 1*: 10 (1939).

Illust.: Nil.

Vern.: Lanky Fescue. *Distr.*: Rare and apparently localized in Victoria, where known only from Maramingo Ck. (E. Gippsland) and Limestone Ck. (sources of Murray R.), both near the New South Wales border; also N.S.W., extending north to the Blue Mtns. and Guyra.

4. Leaves scaberulous and *rough* to touch; panicle \pm glaucescent-green, rarely with purplish tintings, lax, the branches often nodding; lemma 6-8 mm. long; anthers 4-5 mm. long (subalpine grass to 3 ft. high):

189. *F. asperula* J. W. Vickery in *Contr. N.S.W. Herb. 1*: 12 (1939).

F. duriuscula sens. Morris in Ewart *Flor. Vict.* 151 (1931) et auctt. Aust, non L. (1753).

Illust.: E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 71 (1923); Chambers in Maiden, *Agric. Gaz. N.S.W. 15*: t. opp. 245 (1904)—both as "*F. duriuscula*".

Vern.: Graceful Fescue. *Distr.*: Occasional in mountain-forests of eastern Victoria, sometimes ascending into the alps (Mt. Buller, Barry Mts., Mt. Barkly-Ligar region, Wulgulmerang, Suggan Buggan, Cobboras, Bonang-Bendoc region, Delegate R.); also N.S.W., as far north as New England Ranges (4000 ft. near Armidale).

—Leaves \pm glabrous, *smooth* to touch; panicle green to purplish, \pm erect; lemma 4-6 mm. long; anthers 2-3 mm. long (lawn grass, occasionally escaping, rarely to 2 ft. high):

190. **F. rubra* L. *Spec. Plant.* 1: 74 (1753).

**F. duriuscula* L. *Spec. Plant.* 1: 74 (1753).

Illust.: E. F. P. in Breakwell, *Grasses & Fodder Plant.* N.S.W. fig. 72 (1923); Hitchcock in Allan, *Bull. Dep. sci. industr. Res.*, N.Z. 83: fig. 105 (1940); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 114, 116 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 70 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 523 (1923); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3183, col. (1934); Coste, *Flor. Franc.* 3: fig. 4166 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 36 fig. 2 (1908); Reichenbach, *Icon. Flor. germ.* 1: fig. 1557 (1834).

Vern.: Red Fescue (Creeping Fescue). *Distr.*: Indigenous throughout Europe, temperate Asia and N. America; introduced for pastures and lawns in N.Z., Tas., N.S.W. and Victoria where scattered in many parts (e.g. Melbourne, Nathalia, Hopetoun).

[The var. *commutata* Gaud. (*syn. var. fallax* Hackel) is Chewing's Fescue, which differs from typical *F. rubra* in the absence of creeping rhizomes; it is more plentiful both in cultivation and as a naturalized grass in Australia than the var. *rubra*.]

5. Ligule *very large*, 5-10 mm. long; spikelets <9 mm. long, \pm twice as long as broad; lemma quite *awnless*, \pm acute but soon torn and truncate at the hyaline apex, bearing 5 prominent *scabrid dorsal ribs*, broad and *very obtuse* toward the slightly hairy basal callus (tall mountain-forest grass, 4-15 ft. high, with culms and leaf-blades up to 1" wide):

191. *F. dives* F. Muell. *Fragm. Phyt. Aust.* 3: 147 (1863).

Glyceria dives (F. Muell.) Benth. *Flor. aust.* 7: 659 (1878).

Illust.: Bacchus, *Annu. Rep. Dep. Agric. Vict.* 2: t. 22 (1874).

Vern.: Giant Mountain Grass ("Wild Oats"). *Distr.*: Frequent in damp shaded mountain-forests of southern and eastern Victoria, flourishing with bracken after serious fires, but less common in the north-east (Dandenongs and Upper Yarra watershed, slopes of Baw Baws, Strzelecki Range, Wilson Prom., Mts. Buller, Feathertop & Bogong, Suggan Buggan); also N.S.W. and Tas.

[The exact generic position of this grass is still uncertain. It appears to share the characters of both *Poa* and *Festuca*, differing from the former in its rounded (*not* manifestly keeled) lemmas and in the hairy appendage to the grain; but it is here retained, as first described, under the latter more acceptable genus. Benthams (*l.c.*) was certainly mistaken in placing *F. dives* among species of *Glyceria* which differ in their *closed* leaf-sheaths, more than 5-nerved *glabrous* lemmas, *connate* very small lodicules, and *stipitate* glabrous grains *without* any apical appendage (but with a linear hilum *as long as the grain*).]

—Ligule < 5 mm. long; leaf-blades *finely* striate (6-7 ribs per mm.), \pm *scabrid*, seldom > 6" long; spikelets 9-18 mm. long, elliptic to oblong, > twice as long as broad; lemma pointed (not torn), with awn 0.5-3 mm. long, bearing 5-11 \pm smooth nerves, not broadened but slightly *narrowing* toward the shortly *hairy* callus (culms and leaf-blades never > 10 mm. wide, usually much less):

192. *F. hookeriana* F. Muell. ex Hook. f. *Flor. Tasm.* 2: 127 (1858), t. 165, col. (1859).

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Hooker Fescue. *Distr.*: Scattered in damp places through parts of the eastern highlands and in south-western Victoria, often near streams and sometimes ascending to alps (near Portland, Hawkesdale, Port Fairy, Ballarat, Dargo High Plains, Mt. Hotham, Cobboras, Wulgulmerang), but an uncommon grass and apparently growing scarcer through grazing; Tas (northern rivers), N.S.W. (in vicinity of the A.C.T.).

—As for the last, but leaf-sheaths *coarsely* striate (3 ribs per mm.), *almost smooth*, usually > 6" long, the pointed lemma awnless or with awn 1-4 mm. long and the callus quite *glabrous*:

193. **F. arundinacea* Schreb. *Spicil. Flor. lips.* 57 (1771).

F. elatior sens. Morris in Ewart *Flor. Vict.* 152 (1931), *non certe* L. (1753).

Illust.: Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 68 (1923); Adams in Connor, *Bull. Dep. sci. industr. Res., N.Z.* 99: fig. 37 A (1951); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 27 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 122 (1954); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3178 b, col. (1934); Scholl in Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 146 (1908); Coste, *Flor. Franc.* 3: fig. 4160 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1568 (1834).

Vern.: Tall Fescue (Reed Fescue). *Distr.*: Indigenous throughout Europe and temperate Asia; introduced into S. Afr., N. America, N.Z., Tas. (Flinders Id), S.A., N.S.W. and Victoria where an occasional pasture grass on inundated or boggy ground (e.g. Tongala, Yarragon, Orbost).

[The name *F. elatior* has been rather loosely applied throughout the world to the two closely related, robust fodder grasses *F. arundinacea* and *F. pratensis* Huds., but the former species seems to be the only one represented in Victoria. It may be recognized at once by the *shorter* of each pair of panicle-branches, which bears 3 or more spikelets (cf. 1 or 2 spikelets in *F. pratensis*). Two other Eurasian species, *F. gigantea* (L.) Vill. (Giant Fescue) and *F. ovina* L. (Sheep's Fescue)—both with awned lemmas—have been recorded for Victoria by Morris (*l.c.* 150, 151), on the basis of single collections purporting to have come from the Goulburn Valley in 1904 and 1902 respectively; but these species do not seem to have persisted and, since the information on the original labels (from C. Walter's herbarium) is merely "Goulburn", their precise origin is open to question. *F. ovina* is so very closely related to *F. rubra* L. that only a specialist of long training can discriminate between them; the former (also a useful hardy lawn species) has in general *open* leaf-sheaths, slightly narrower blades and shorter-awned lemmas, but all Victorian collections examined to date conform better to the circumscription of *F. rubra*.]

81. *VULPIA* K. C. Gmel. (1805)

1. Lemmas manifestly *ciliate*, at least on the upper margins (of uppermost florets) 4
 Lemmas *all glabrous* on margins 2
2. Panicle *long-exserted*; lower glume 2-5 mm. long, at least half the length of upper; lemma minutely scabrid, 5-8 mm. long (almost equalling upper glume):

194. **V. bromoides* (L.) S. F. Gray, *Nat. Arr. brit. Plant.* 2: 124 (1821).
Festuca bromoides L. *Spec. Plant.* 1: 75 (1753).

Illust.: *Wild Life* 4: 420, 423 (1942), as "*Festuca bromoides*"; E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 73 (1923), as "*Festuca bromoides*"; Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 31 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 134 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 46 (1951), as "*Festuca dertonensis*"; Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 505 (1923), as "*Festuca bromoides*"; Herter, *Flor. il. Uruguay* 1: fig. 206 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3175, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1227 (1931), as "*Festuca myuros*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1529 (1834).

Vern.: Squirrel-tail Fescue (Brome Fescue, Six-weeks Fescue—U.S.A.). *Distr.*: Indigenous to Europe, W. Asia, N. & tropical Africa; introduced into S. Afr., N. & S. America, N.Z., all Australian States and frequent throughout Victoria (Mallee, coast, alps, western plains, towns etc.—usually in open places).

—Panicle only *very shortly* exserted or its base enclosed in upper leaf-sheath; lower glume 0.2-2 mm. long, <half the length of upper (usually <½) 3

3. Lower glume *minute* (0.2-1.5 mm.), \pm one tenth the length of upper (10-15 mm. long); lemma 8-15 mm. long, minutely scabrid, with *wide hyaline margins* (grass of coastal sand, the dense contracted panicle *stiffly erect* and \pm *Hordeum*-like):

195. **V. membranacea* (L.) Dumort. *Obsns Gram. Flor. belg.* 100 (1823).
Stipa membranacea L. *Spec. Plant.* 1: 560 (1753).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 140 (1954); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1228 (1931); Bouloumoy, *Flor. Liban & Syrie* t. 495 fig. 3 (1930), as "*V. uniglumis*"; Coste, *Flor. Franc.* 3: fig. 4149 (1906), as "*V. uniglumis*"; Gordon, *Manual Brit. Grasses* t. 23 (1907), as "*Festuca uniglumis*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1527 (1834), as "*V. uniglumis*".

Vern.: Dune Fescue (One-glumed Fescue). *Distr.*: Indigenous to the coasts of W. Europe (including S. Britain) and the Mediterranean; introduced into W.A. (Recherche Archipelago) and Victoria where known only from beach sand between Port Melbourne and mouth of Yarra R., also at Seaford (Sept. 1959).

—Lower glume 0.5-2 mm. long, at least *one-sixth* the length of upper (3-7 mm.); lemma 5-7 mm. long, scabrid, *without* hyaline margins (panicle usually *curved or nodding* and often interrupted):

196. **V. myuros* (L.) K. C. Gmel. *Flor. badens.* 1: 9 (1805).
Festuca myuros L. *Spec. Plant.* 1: 74 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 25 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 166 (1943); Connell in Chippindall, *Grasses & Pastures S. Afr.* fig. 32 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 136 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 47 (1951), as "*Festuca myuros*"; Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 507 (1923), as "*Festuca myuros*"; Herter, *Flor. il. Uruguay* 1: fig. 204 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3171, col. (1934); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 35 fig. 4, col. (1907); Coste, *Flor. Franc.* 3: fig. 4152 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1524 (1834).

Vern.: Rat's-tail Fescue. *Distr.*: Indigenous to W., S. and Central Europe and the Mediterranean region to S.W. Asia; introduced into S. Afr., N. & S. Amer., N.Z., Tas., S.A., N.S.W. and Victoria where known with certainty from only a few isolated localities (Warby Range, Heathcote, Creswick, Dimboola), but doubtless overlooked because of a superficial resemblance to *V. megalura*.

4. Margins of at least the uppermost lemmas in each spikelet ciliate, with cilia confined to apical third; lower glume 0.5-2 mm. long, the upper 3-7 mm. long:

197. **V. megalura* (Nutt.) Rydb. in *Bull. Torrey bot. Cl.* 36: 538 (1909).
Festuca megalura Nutt. in *Proc. Acad. nat. Sci. Philad.* new ser. 1: 188 (1848).

Illust.: Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 45 (1951); Silveus, *Texas Grasses* 25 (1933); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 506 (1923); Herter, *Flor. il. Uruguay* 1: fig. 205 (1941)—all except Herter as "*Festuca megalura*".

Vern.: Fox-tail Fescue. *Distr.*: Indigenous to the United States, Central & S. America; introduced into N.Z., all Australian States and frequent in many parts of Victoria, especially western districts (e.g. Bacchus Marsh, Skipton, Bendigo, Ararat, Swan Hill, Far North-west) where often co-extensive with *V. bromoides*.

—Margins of lemmas long-ciliate from apex to base; lower glume minute (<0.5 mm. long), the upper 2-3 mm. long:

198. **V. ciliata* (Pers.) Link *Hort. bot. Berol.* 1: 147 (1827).
Festuca ciliata Pers. *Synops. Plant.* 1: 94 (1805).

Illust.: Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3172, col. (1934); Bouloumoy, *Flor. Liban & Syrie* t. 495 fig. 1-2 (1930); Coste, *Flor. Franc.* 3: fig. 4151 (1906).

Vern.: Fringed Fescue. *Distr.*: Indigenous to the Mediterranean region; introduced into S.A. (Mt. Lofty Range) and a few scattered spots in Victoria (Mt. Beckworth near Clunes, Lower Glenelg Plantation near Rennick in the extreme south-west, Mt. Ida near Heathcote, Warby Range in north-east).

82. **LOLIUM* L. (1753)

1. Lemmas ovate to elliptic, turgid or swollen in fruit, awned or awnless, the uppermost not exceeding the long general glume (annual 1-3 ft.; spikelets >12 mm. long, 5- to 10-flowered):

199. **L. temulentum* L. *Spec. Plant.* 1: 83 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 57 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 183 (1943); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 82 (1923); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 30 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 132 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 371 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 562 (1923); Herter, *Flor. il. Uruguay* 1: fig. 237 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3238, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1214 (1931); Coste, *Flor. Franc.* 3: fig. 4250 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1342-44 (1834).

Vern.: Darnel (Drake, Bearded Rye-grass, Tares). *Distr.*: Indigenous to the Mediterranean region; but now a widespread weed throughout temperate parts of the world—W. Europe, Asia, N. & S. Amer., S. Afr., N.Z., all Australian States and in Victoria noted at Melbourne, Frankston, Dimboola, Far North-west, Suggan Buggan, Graytown and Nathalia, often on waste land.

—Lemmas \pm lanceolate, never turgid or swollen 2

2. Spikelet not or hardly exceeding the glume, remaining rigidly erect at maturity 4

Spikelet exceeding (and typically much longer than) glume, \pm spreading from rachis at maturity 3

3. Lemmas shortly pointed or blunt, awnless; spikelet seldom >10-flowered (perennial, with leaf-blades folded about midrib when very young):

200. **L. perenne* L. *Spec. Plant.* 1: 83 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 56 fig. A-G (1952); Morris in Ewart, *Flor. Vict.* fig. 117 A-B (1931); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 80 (1923); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 128 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 370 B (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 561 (1923); Herter, *Flor. il. Uruguay* 1: fig. 240 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3241, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1213 (1931); Coste, *Flor. Franc.* 3: fig. 4253 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 38 fig. 5 (1908); Reichenbach, *Icon. Flor. germ.* 1: fig. 1346 (1834).

Vern.: Perennial Rye-grass. *Distr.*: Indigenous to Europe, temperate Asia and N. Afr.; introduced as a valuable pasture plant and now extensively naturalized in S. Afr., N. & S. Amer., N.Z., all Australian States—very frequent throughout settled districts of Victoria where known from such widely separated places as Melbourne, Dandenongs, Otways, Colac, St. Arnaud, Little Desert, Far North-west, Nathalia, Cornishtown, Benambra, Suggan Buggan, Lakes Entrance, Phillip Id, Barry Mtns., Baw Baws, Lake Mtn.

[The distinctive var. *cristatum* Pers. *Synops. Plant.* 1: 110 (1805) has short, very broad spikes in which the crowded spikelets spread out almost horizontally; it appears occasionally in Victoria, e.g. Kaniva district (Mar. 1952). *L. perenne* hybridizes readily with the succeeding species, *L. multiflorum*, one rapidly growing New Zealand hybrid finding favour as "Short Rotation Rye-grass".]

—Lemmas with fine, straight, terminal awns up to 1 cm. long; spikelet seldom <10-flowered (annual or biennial, with leaf-blade rolled in the young shoots—seen by a transverse section of shoot):

201. **L. multiflorum* Lam. *Flor. franc.* 3: 621 (1778).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 117 C-D (1931); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 81 (1923); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 94 (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 29 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 130 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 370 A (1951); Gill in Abrams, *Ill. Flor. Pacific States I*: fig. 560 (1923); Herter, *Flor. il. Uruguay I*: fig. 243 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3240, col. (1934); Coste, *Flor. Franc.* 3: fig. 4255 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1345 (1834), also *l.c.* 7: t. 77, col. (1845), as "*L. italicum*".

Vern.: Italian Rye-grass. *Distr.*: Indigenous to Central & S. Europe, N.W. Afr. and S.W. Asia; introduced as a valuable fodder plant into Britain, S. Afr., N. & S. Amer., N.Z., all Australian States including Tas. and now widespread in Victoria as a naturalized grass, but much less frequent than *L. perenne* and apparently absent or scarce in the alps and E. Gippsland (noted at Melbourne, Dandenongs, Torquay, Creswick, Dimboola, Graytown, Cornishtown).

4. Culms usually 1-3 ft. high; glume >1 cm. long, slightly shorter than spikelet; lemmas \pm obtuse, usually all awnless:

202. **L. rigidum* Gaudin *Agrost. helv.* 1: 334 (1811).

L. hybridum sens. Morris in Ewart *Flor. Vict.* 200 (1931), non Hausskn. (1887).

Illust.: M. F. in Whittet, *Agric. Gaz. N.S.W.* 37: 296 fig. 1-2 (1926); Mullett, *J. Dep. Agric. Vict.* 17: 269, 270, 272 (1919), as "*L. subulatum*"; Herter, *Flor. il. Uruguay I*: fig. 239 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3239, col. (1934), as "*L. strictum*"; Coste, *Flor. Franc.* 3: fig. 4252 (1906); Bouloumoy, *Flor. Liban & Syrie* t. 497 fig. 3 (1930); Reichenbach, *Icon. Flor. germ.* 1: fig. 1398 (1834), as "*Agropyron rigidum*".

Vern.: Wimmera Rye-grass. *Distr.*: Indigenous to the Mediterranean region; introduced into S. Amer., Qd, N.S.W., S.A., W.A., Victoria (Minyip, Warracknabeal, Dimboola, Horsham, Noradjuha, Little Desert, Nhill, Beulah, Graytown, Rutherglen, Cornishtown etc.) where, under the popular name "Wimmera Rye-grass", it acquired importance as a valuable fodder—the heaviest growth, to 3 ft. high, was on low-lying "crabhole" country of the Wimmera under an annual rainfall of 15-20".

[*L. hybridum* Hausskn. was described as a hybrid between *L. perenne* and *L. multiflorum*; but there is no justification for applying this name to "Wimmera Rye-grass"—the bulk of material, so called, is unquestionably referable to *L. rigidum*. Probably some *Lolium* hybrids do occur in Victoria, after mixed seed of two or more species has been sown together, but their existence and composition need to be confirmed by careful experiment. Inter-generic hybrids between *Lolium* and *Festuca* are known in Britain.]

- Culms <1 ft. high (usually <6"), wiry; spike tardily opening up, *Monerma*-like; glume <1 cm. long (usually \pm 7 mm.), longer than spikelet, the rhachis just below it often swollen and \pm cushion-like; lemmas acute, the uppermost shortly awned:

203. **L. loliaceum* (Bory & Chaub.) Hand.-Mazz. in *Ann. naturh. (Mus.) Hofmus. Wien* 28: 32 (1914).
Rottboellia loliacea Bory & Chaub. in *Bory Exped. sci. Mor. 3 Bot.*: 46, t. 3 fig. 2 (1832).

Illust.: Bory de St. Vincent & Chaubard (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 184 (1943), as "*L. subulatum*"; E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 83 (1923), as "*L. rigidum*"; Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 372 (1951), as "*L. subulatum*"; Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 563 (1923), as "*L. subulatum*"; Chebataroff, *Commun. bot. Mus. Montevideo 14*: 7 (1944), as "*L. subulatum*"; Herter, *Flor. il. Uruguay 1*: fig. 244 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3238 c, col. (1934), as "*L. subulatum*".

Vern.: Stiff Rye-grass (Rigid Rye-grass). *Distr.*: Indigenous to the Mediterranean region; introduced into S. Afr., N. & S. Amer., all Australian States, including Tas., and in Victoria an occasional weed of sandy ground, more frequent near the sea (Melbourne, Kailor, Altona, St. Leonards, Torquay, St. Arnaud, Upper Glenelg R., Cornishtown, Marlo).

[European *L. remotum* Schrank (Flax Rye-grass) appeared sporadically in Victorian flax crops (e.g. at Werribee and Leongatha) during World War II, but it does not seem to have persisted anywhere. This species is closely related to *L. temulentum*, but with more distant much smaller turgid spikelets (less than 10 mm. long).]

83. *CYNOSURUS L. (1753)

Ligule 3-10 mm. long; panicle ovoid to broadly oblong, 1-2 cm. wide, very bristly; spikelets densely and irregularly clustered (sometimes nearly all sterile); awns of fertile lemmas 6-16 mm. long (annual):

204. **C. echinatus* L. *Spec. Plant. 1*: 72 (1753).

Illust.: Gardner, *Flor. W. Aust. 1¹* (Gramineæ): t. 11 fig. B (1952); Morris in Ewart, *Flor. Vict.* fig. 71 (1931); Chippindall, *Grasses & Pastures S. Afr.* fig. 33 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 192 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 249 (1951); Herter, *Flor. il. Uruguay 1*: fig. 225 (1941); Letty in Bews *World's Grasses* fig. 28 (1929); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3169, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1231 (1931); Scholl in Hegi, *Ill. Flor. Mittel-Eur. 1*: fig. 120 (1907); Coste, *Flor. Franc. 3*: fig. 4146 (1906); Reichenbach, *Icon. Flor. germ. 1*: fig. 1350 (1834).

Vern.: Rough Dog's-tail. *Distr.*: Indigenous to the Mediterranean region; introduced into Britain, S. Afr., N. & S. Amer., N.Z., all States except Qd, and in Victoria an occasional weed of cooler southern districts, often on rich loamy soils (Daylesford, Melbourne, Dandenongs, Phillip Id, Traralgon, Lakes Entrance, Colac, Hamilton, etc.).

Ligule very blunt, <2 mm. long; panicle narrow-oblong to linear, 5-10 mm. wide, not bristly; spikelets dense, but arranged in 2 \pm regular rows; awns of fertile lemmas <2 mm. long or absent (perennial):

205. **C. cristatus* L. *Spec. Plant. 1*: 72 (1753).

Illust.: Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 95 (1940); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 194 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 248 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 450 (1923); Herter, *Flor. il. Uruguay 1*: fig. 224 (1941); Poinot in

Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3168, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1230 (1931); Coste, *Flor. Franc.* 3: fig. 4145 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 33 fig. 5, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1351-52 (1834).

Vern.: Crested Dog's-tail. *Distr.*: Indigenous to Europe, S.W. Asia and the Azores; introduced into N. & S. Amer., N.Z., Tas., N.S.W., W.A. and Victoria where occasional in lawns or as a wayside weed of southern districts (Melbourne, Dandenongs).

84. **LAMARCKIA* Moench (1794)

206. **L. aurea* (L.) Moench *Meth. Plant.* 201 (1794).

Cynosurus aureus L. *Spec. Plant.* 1: 73 (1753).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 68 (1931); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 250 (1951); Bailey, *Stand. Cycl. Hort.* popular ed.: fig. 2063 (1939); Bouloumoy, *Flor. Liban & Syrie* t. 493 fig. 3 (1930); Hayward & Druce, *Advent. Flor. Tweedside* 246 (1919); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3170, col. (1934); Coste, *Flor. Franc.* 3: fig. 4148 (1906), as "*Cynosurus aureus*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1515 (1834), as "*Chrysurus aureus*".

Vern.: Golden-top. *Distr.*: Indigenous to the Mediterranean region; introduced into Pakistan, S. Afr., N. Amer., N.S.W., Qd, S.A., W.A. and Victoria where a frequent annual of dryish ground in several western districts (Nathalia, Maribyrnong R. near Keilor, Dimboola, Far North-west—usually near settlement).

Diagn.: Glabrous tufted annual 2-6" (rarely to 10") high; leaf-blades flat, acuminate, 1-4" long, 3-6 mm. wide; ligule hyaline, very conspicuous, obtuse at first but soon lacerated, 5-15 mm. long; panicle unilateral, 1-2" long, compact but light and feathery, ovate-oblong, golden-hued at maturity; spikelets of 2 kinds, in fascicles of 4-6 which fall as a whole, the 1 or 2 fertile and awned spikelets central and hidden (except for their awns) by the 2-4 longer barren ones; outer glumes of all spikelets similar, linear-lanceolate 3-4 mm. long; fertile spikelet with 1 bisexual flower, its rhachilla elongated and pedicel-like above the glumes, the lemma 2-5 mm. long and pubescent toward apex which bears a slender awn \pm 6 mm. long from just below the notch, the upper stalked empty lemma with much shorter awn; anthers minute (<0.5 mm. long); barren spikelets 10-15 mm. long, each with 6-10 short, truncate, awnless empty lemmas loosely arranged in 2 opposite rows on slender rhachilla.

[Also in the tribe *Festuceæ* is the Eurasian grass *Melica uniflora* Retz. (Wood Melick) which Morris in Ewart's *Flor. Vict.* 143 (1931) claimed to be naturalized in north-eastern Victoria. The only confirmatory specimen in Melbourne Herbarium is one of C. Walter's collecting, labelled "Goulburn, 1902", and its origin is open to question. No one else in the past half-century seems to have observed *Melica* anywhere in Victoria, nor has it been reported from any other State. The small, very isolated 1-fruited spikelets of the open panicles are deciduous as a whole.]

Tribe GLYCERIEÆ

85. GLYCERIA R. Br. (1810)

Culm slender, rather weak, 2-3 ft. high; panicle narrow, very contracted; spikelets usually <50 (often few), linear, 10-25 mm. long, with 6-20 flowers, pale green; lower glume 5-7 mm. long; lemma 6-10 long, acuminate (at least the lower, and sometimes all, leaves prominently cross-veined or even septate-nodulose):

207. *G. australis* C. E. Hubbard in *Kew Bull.* 1934: 450 (1934).

G. fluitans sens. Morris in Ewart *Flor. Vict.* 167 (1931), atque J. M. Black *Flor. S. Aust.* ed. 2: 125 (1943), non (L., ut *Festuca*) R. Br. (1810).

Illust.: Grosse in *J. Dep. Agric. S. Aust.* 10: 745 (1907); Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. opp. 121 (1891); Bacchus, *Annu. Rep. Dep. Agric. Vict.* 2: t. 16 (1874)—all as "*G. fluitans*".

Vern.: Australian Sweet-grass (Manna Grass). *Distr.*: Widespread and rather frequent in the cooler parts of Victoria, growing in or against water of streams, lagoons or freshwater swamps from the South Australian to New South Wales border (e.g. Lower Glenelg R., Curdie's R., Brisbane Range, Ballarat & Creswick, Ballan, Yarra R., Plenty R., Goulburn R., Warragul, Benambra, Lower Mitta Mitta R., Cann R., Wulgulmerang, Bendoc); Tas., S.A., N.S.W., Qd.

[The European and North American *G. fluitans* (L.) R. Br. (Floating Sweet-grass or Flote-grass), with which *G. australis* has been identified by most Australian writers, differs in having much shorter glumes (the lower only 2-3 mm. long), rather shorter almost *obtus*e lemmas and the leaves *without* obvious cross-veins; it would seem to have become naturalized in New Zealand, perhaps also in Western Australia and other parts of the Commonwealth.]

Culm stout, 3-8 ft. high; panicle open, usually broad; spikelets *very numerous* (>100 per panicle), *oblong*, 5-10 mm. long, with 4-8 flowers, often purplish; lower glume 2-3 long; lemma 2-4 mm. long, *very obtus*e:

208. **G. maxima* (Hartm.) Holmb. in *Bot. Notiser* 1919: 97 (1919).

Molinia maxima Hartm. *Handb. Skand. Flor.* 55 (1820);

G. aquatica (L., ut *Poa*) Wahlb. *Flor. gothob.* 18 (1820), non (L., ut *Aira*) J. & C. Presl (1819).

Illust.: *J. Dep. Agric. S. Aust.* 10: 746 (1907), as "*Poa aquatica*"; Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 102 (1954); Heukel & van Oostroom, *Flor. Nederl.* ed. 14: fig. 928 (1956); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1234 (1931), as "*Poa aquatica*"; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3130, col. (1934), as "*G. aquatica*"; Coste, *Flor. Franc.* 3: fig. 4101 (1906), as "*G. aquatica*"; Scholl in Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 134 (1908), as "*G. aquatica*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1614 (1834), as "*G. aquatica*".

Vern.: Reed Sweet-grass (Water Meadow-grass, Reed-grass). *Distr.*: Indigenous throughout Europe and temperate Asia; introduced as a nutritious fodder to stream-banks and wet places in parts of N. Amer., N.Z., N.S.W., Qd and Victoria where naturalized on the Latrobe River flats near Noojee, Timboon, and at Cohuna.

Tribe BROMEÆ

86. *BROMUS* L. (1753)

1. Spikelet *expanded* at apex after flowering, the flowers divergent; awn at least as long as lemma (sometimes longer); lower glume with 1 or 3 nerves (annuals) 5

Spikelet *contracted* at apex (even after flowering), the flowers *not* divergent or, if so, then awns much shorter than lemmas; lower glume with 5 or 7 nerves 2

2. Panicle *dense*, ovoid to oblong; awn *as long as* or longer than lemma which is \pm *rounded on back* (downy annuals) 4
Panicle *open*, spreading, lax; awn manifestly *shorter* than lemma which is sharply *keeled* and much compressed laterally (annual to perennial) 3
3. Awns *minute* (<3 mm. long) or absent; spikelet *glabrous* or minutely scabrid, 5-8 mm. wide; panicle-branches *long* (to 6"), often drooping:

209. **B. unioides* (Willd.) Humb. et al. *Nov. Gen.* 1: 151 (1816).

Festuca unioides Willd. *Hort. berol.* 1: 3, t. 3 (1806).

Illust.: Willdenow (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 29 fig. B (1952), as "*Ceratochloa cathartica*"; *Wild Life* 4: 421-22 (1942), as "*B. catharticus*"; Black, *Flor. S. Aust.* ed. 2: fig. 170 (1943), as "*B. catharticus*"; Morris in Ewart, *Flor. Vict.* fig. 77 (1931); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 60 (1923); Atkinson in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 99 (1940), as "*B. catharticus*"; Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 35 (1955), as "*B. catharticus*"; Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 3 (1951), as "*B. catharticus*"; Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 530 (1923); Herter, *Flor. il. Uruguay* 1: fig. 202 (1941), as "*Ceratochloa cathartica*"; Silveus, *Texas Grasses* 12 (1933), as "*B. catharticus*".

Vern.: Prairie Grass (Rescue Grass). *Distr.*: Indigenous to South America; introduced into N. Amer., S. Afr., Pakistan, N.Z., all Australian States and very frequent throughout settled areas of Victoria (in such widely separated places as Melbourne, Dandenongs, Frankston, Queenscliff, Anglesea, Colac, Creswick, St. Arnaud, Far North-west, Graytown, Cornishtown, Phillip Id, Wilson Prom., Lakes Entrance, Suggan Buggan)—a luxuriant weed to 3 ft. high on good well-watered soils, becoming biennial or perennial.

[Some authors, notably J. M. Black in *Flor. S. Aust.* ed. 2: 128 (1943), have adopted an earlier name, *B. catharticus* Vahl (1791); but there is doubt concerning the typification of Vahl's name, and until this plant can be certainly identified with *Festuca unioides* Willd., it seems preferable to retain the latter—and certainly more familiar—epithet.]

—Awns conspicuous, 5-7 mm. long; spikelet with appressed *pubescence*, 5 mm. wide or less; panicle-branches rather *short* (<3" long), erect:

210. **B. cebadilla* Steud. *Synops. Plant. glumac.* 1: 321 (1854).

Illust.: Nil.

Vern.: Chilean Brome. *Distr.*: Indigenous to Chile, but naturalized in Victoria at a few places near Port Phillip Bay (notably Balnarring and the Dandenong Ranges, also Caulfield where still persisting).

[A collection from Caulfield, Vic. (Dec. 1919), was determined by Mrs. Agnes Chase of Washington, D.C. (1/12/1921), as referable to the South American *B. cebadilla*; another from Balnarring (Dec. 1949) was examined by Miss Elizabeth McClintock of San Francisco (6/1/1950), and pronounced as very near to, if not identical with, North American *B. marginatus* Nees ex Steud.—both species described simultaneously and on consecutive pages of the same work. All Victorian examples are here considered as representing a single species, and the former name, used by Morris in Ewart's *Flor. Vict.* 154 (1931), is here adopted pending re-investigation by a specialist with adequate knowledge of both and of other kindred American species. *B. brevistaratus* Buckl., a synonym of *B. marginatus*, is recorded for the Auckland metropolitan area, N.Z.]

4. Spikelet <2 cm. long; glumes *broadly acute* to obtusish; awns *erect*, <1 cm. long;

211. *B. mollis L. *Spec. Plant.* ed. 2, 1: 112 (1762).

Illust.: E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 64 (1923); E. F. P. in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 98 (1940); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 56 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 29 (1951); Herter, *Flor. il. Uruguay* 1: fig. 201 (1941); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3204, col. (1934); Coste, *Flor. Franc.* 3: fig. 4202 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 37 fig. 3 (1908); Reichenbach, *Icon. Flor. germ.* 1: fig. 1591-92 (1834).

Vern.: Soft Brome (Lop Grass, Goose Grass). *Distr.*: Indigenous throughout Europe and W. Asia; introduced into N. & S. Amer., N.Z., all Australian States and in Victoria a widespread frequent weed of the Mallee, plains, coast, alps and all settled areas—from the Far North-west and Glenelg R. to the sources of Murray R., but apparently scattered in East Gippsland.

[As pointed out by C. E. Hubbard in *Pelican Book A* 295 (Grasses): 57 (1954), "*B. mollis* belongs to a group of closely related species which, perhaps on account of the presence of hybrids, are difficult to distinguish". To this assemblage belong the glabrous-flowered *B. thominii* Hard., recorded for South Australia by J. M. Black in *Flor. S. Aust.*, ed. 2: 129 (1943) under the name "*B. hordeaceus* L.," *B. lepidus* Holmb., *B. ferronii* Mabilie and *B. molliiformis* Lloyd—the last recorded for New South Wales and Western Australia. It is possible that some of these occur also in Victoria, and have been confused hitherto with *B. mollis*, but evidence is at present lacking.]

—Spikelet >2 cm. long; glumes *acuminate*; awns *bent* and *spreading outwards*, >1 cm. long, inserted lower than in other species (4-5 mm. below the notched apex of lemma):

212. *B. macrostachys Desf. *Flor. atlant.* 1: 96, t. 19 fig. 2 (1798).

B. scoparius sens. Morris in Ewart *Flor. Vict.* 155 (1931), *non* L. (1755).

Illust.: Desfontaines (*l.c.*); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3209, col. (1934); Coste, *Flor. Franc.* 3: fig. 4206 (1906); Bouloumoy, *Flor. Liban & Syrie* t. 489 fig. 1 & 5 (1930).

Vern.: Mediterranean Brome. *Distr.*: Indigenous to the Mediterranean region; introduced and occasional on sandy soil in drier western and northern districts of Victoria (Murtoa, Donald, Talbot, Sydenham, Merrigum, near Shepparton, Barmah Forest); also S.A. at Adelaide and Kingscote (Kangaroo Id).

5. Lower glume 3-nerved, upper glume 5-nerved (flaccid indigenous grass of sandy ground in north and west of State; panicle 3-6" long, very loose, with distant, capillary, \pm drooping branches; awns \pm 15 mm. long):

213. B. arenarius Labill. *Nov. Holl. Plant. Specim.* 1: 23, t. 28 (1805).

Illust.: Labillardière (*l.c.*); Grosse in Turner, *Aust. Grasses* t. opp 15 (1895); Buchanan, *Indig. Grasses N.Z.* t. 56 A (1880); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 35 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 558 (1923); Bailey, *Ill. Monogr. Grasses* Od 1: t. [10] (1878).

Vern.: Sand Brome. *Distr.*: The only indigenous species of *Bromus* in Australia, it is scattered through sandy open terrain in western and north-eastern Victoria (Far North-west, Swan Hill, Donald, Minyip, Dimboola, Moyston, Portland, Omeo, Upper Murray R., and apparently once near Melbourne), but uncommon; all States except Tas., N.Z., introduced and naturalized in parts of western N. Amer. (incl. California).

—Lower glume 1-nerved, upper glume 3-nerved 6

6. Panicle usually *purplish*, \pm *dense*, stiffly erect and brush-like, the branches rarely exceeding 2 cm. 8

Panicle *not* purplish, *very loose* and spreading, at least the lower branches usually >2 cm. long 7

7. Longer panicle-branches with 4 or more spikelets which (including awns) are <4 cm. long; lemma <13 mm. long, with broad hyaline margins; awn 1.1-1.8 cm. long; anthers <1 mm. long:

214. **B. tectorum* L. *Spec. Plant.* 1: 77 (1753).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 44 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 40 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 554 (1923); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3199, col. (1934); Coste, *Flor. Franc.* 3: fig. 4190 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 38 fig. 1 (1908), Reichenbach, *Icon. Flor. germ.* 1: fig. 1582 (1834).

Vern.: Drooping Brome (Downy Brome, Downy Chess, Wall Brome). *Distr.*: Indigenous to the Mediterranean region; introduced into Pakistan, W. Eur. (including Britain), N. Amer., N.Z., N.S.W. and Victoria where an occasional weed of roadsides and waste places against towns (chiefly in the Melbourne area).

—Longer panicle-branches bearing only 1 or 2 spikelets, the latter (with awns) 4-6 cm. long; lemma 14-20 mm. long; awn 1.5-3 cm. long; anthers >1 mm. long:

215. **B. sterilis* L. *Spec. Plant.* 1: 77 (1753).

Illust.: *Wild Life* 4: 420-422 (1942); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 63 (1923); E. F. P. in Allan, *Bull. Dep. Sci. industr. Res., N.Z.* 83: fig. 97 (1940); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 42 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 37 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 555 (1923); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3200, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1219 (1931); Coste, *Flor. Franc.* 3: fig. 4191 (1906); Scholl in Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 1957 (1908); Reichenbach, *Icon. Flor. germ.* 1: fig. 1583 (1834).

Vern.: Barren Brome (Sterile Brome). *Distr.*: Indigenous almost throughout Europe and S.W. Asia; introduced into N. Amer., N.Z., Tas., N.S.W., Qd and Victoria where scattered through the western half of State (Melbourne, Graytown, Goulburn R., Lerderderg Gorge, St. Arnaud, Serviceton North, Murray R. below Mildura), but often confused with *B. diandrus* and exact range within the State not known.

—As for the last, but spikelets *much larger* (7-9 cm. long), lemma >2 cm. long and awn 3.5-6 cm. long:

216. **B. diandrus* Roth *Bot. Abh. Beobacht.* 44 (1787).*B. villosus* Forsk. *Flor. ægypt.-arab.* 23 (1775), non Scop. (1772);*B. rigidus* sens. J. M. Black *Flor. S. Aust.*, ed. 2: 128 (1943), non Roth (1790);*B. gussonii* Parl. *Plant. nov.* 66 (1842).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 27 fig. c-g (1952), as "*B. gussonii*"; E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 65 (1923), as "*B. maximus*"; Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 38 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 48 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 36 (1951), as "*B. rigidus*"; Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 556 (1923), as "*B. rigidus*"; Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3201 b, col. (1934), as "*B. gussonei*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1220 (1931), as "*B. maximus*"; Coste, *Flor. Franc.* 3: fig. 4192 (1906), as "*B. maximus*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1585 (1834), as "*B. maximus*".

Vern.: Great Brome (Rip-gut Grass—U.S.A.) *Distr.*: Indigenous to the Mediterranean region; introduced into Britain, S. Africa., N. & S. Amer., N.Z., all Australian States and in Victoria a very widespread and frequent weed (at such dispersed localities as Melbourne, Dandenongs, Queenscliff, Brisbane Range, Creswick, St. Arnaud, Colac, Hamilton, Glenelg R., Dimboola, Far North-west, Bendigo, Graytown, Upper Goulburn R., Limestone Ck. at Murray R. source, Gabo Id.).

8. Culm pubescent below the very dense, ovoid panicle; spikelet usually <3 cm. long; lemma <15 mm. long:

217. **B. rubens* L. *Cent. 1 Plant.* 5 (1755).

Illust.: Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 38 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 549 (1923); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3198 b, col. (1934); Coste, *Flor. Franc.* 3: fig. 4194 (1906).

Vern.: Red Brome. *Distr.*: Indigenous to the Mediterranean region; introduced into N. Amer., N.S.W., S.A., W.A., Qd and Victoria where frequent on sandy soils of the inland northern and north-western districts (Rutherglen, Nathalia, St. Arnaud, Wycheproof, Dimboola, Mitre Rock, Little Desert, Wyperfeld Nat. Park, Far North-west).

—Culm glabrous throughout; panicle rather loose (but not open), spreading and \pm flattened above; spikelet 3.5-6 cm. long; lemma very narrow, usually 15-20 mm. long:

218. **B. madritensis* L. *Cent. 1 Plant.* 5 (1755).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 169 (1943); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 46 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 39 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 549 (1923); Herter, *Flor. il. Uruguay 1*: fig. 199 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3198, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1221 (1931); Coste, *Flor. Franc.* 3: fig. 4193 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1584 (1834).

Vern.: Compact Brome (Madrid, Stiff and Wall Brome). *Distr.*: Indigenous to the Mediterranean region; introduced into W. Eur., N. & S. Amer., all Australian States and rather widespread in the open drier parts of Victoria, particularly on sandy soils of the western districts (Melbourne, Mansfield, Graytown, Nathalia, Cornishtown, Creswick, Far North-west, etc.).

[In conformity with J. M. Black's treatment in *Flor. S. Aust.* ed. 2: 128-129 (1943) and C. E. Hubbard's in *Pelican Book A 295* (Grasses): 43-67 (1954), no attempt is made here to split up *Bromus* into segregate genera—as was done by J. W. Vickery in *Contr. N.S.W. Herb.* 1: 276, 280 (1950), C. A. Gardner in *Flor. W. Aust.* 1¹ (Gramineæ): 94-99, 104 (1952), and by Clapham, Tutin & Warburg in *Flor. Brit. Isles* 1449-1458 (1952). Those species placed under the genera *Anisantha* C. Koch and *Bromus* L. (sensu stricto) by Clapham, Tutin & Warburg were assigned to *Bromus* L. and *Serrafalcus* Parl. respectively by both Vickery and Gardner; so, until there is general agreement on the delimitation and typification of generic segregates, it would be premature to divide *Bromus* for the purposes of this key.

The almost awnless Eurasian *B. inermis* Leyss. (Hungarian Brome) was reported by Morris in Ewart's *Flor. Vict.* 155 (1931) to be "widely spread in Victoria"; but it has never been observed growing spontaneously anywhere in the State by the present writer, and the only local collection represented in Melbourne Herbarium is labelled "Heathcote, 1907"—presumably cultivated. A few isolated plants were noted recently by the roadside at Rangeby near Korumburra (Nov. 1957), the species being depicted in Breakwell's *Grasses & Fodder Plant. N.S.W.* fig. 61 (1923). Similarly, the European *B. racemosus* L. (Smooth Brome) is described by Morris (*l.c.*) as "widely spread in Victoria", albeit the only voucher specimen in Melbourne Herbarium bears the label "Gippsland, 1887"; this close but glabrous relative of *B. mollis* is recorded also for New South Wales and New Zealand.]

Tribe BRACHYPODIÆ

87. *BRACHYPODIUM Pal. Beauv. (1812)

219. **B. distachyum* (L.) Pal. Beauv. *Ess. Agrost.* 101 (1812).

Bromus distachyos L. *Cent. 2 Plant.* 8 (1756).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 24 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 171 (1943); Morris in Ewart, *Flor. Vict.* fig. 75 (1931); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 42 (1951); Herter, *Flor. il. Uruguay* 1: fig. 255 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3235, col. (1934); Javorka & Csapody, *Icon. Flor. Hungar.* 46 (1929); Heukels, *Flor. Nederl.* 1: fig. 485 (1911); Coste, *Flor. Franc.* 3: fig. 4245 (1906); Reichenbach, *Icon. Flor. germ.* 1: t. 14 (1834), as "*Trachynia distachya*".

Vern.: False Brome. *Dist.*: Indigenous to Mediterranean region, Cent. Europe and W. Asia; introduced into parts of W. Eur., S. Afr., N. & S. Amer., Tas., N.S.W. (southern), S.A., W.A. and Victoria where an uncommon weed of dryish and sometimes rocky ground (Studley Park near Melbourne, Campbellfield, Daylesford, Dooen).

Diagn.: Small annual 4-10" high; culms \pm geniculate; nodes pubescent; leaf-blades 1-3" long, flat, greyish, scabrid or with scattered stiff hairs; ligule 1-1.5 mm. long, broad, hairy, \pm lacerate; spikelets rigidly erect, almost sessile, \pm 1" long (excluding awns), 2-4 in a short spike-like raceme; lemmas 7-14, minutely punctulate, each 8-10 mm. long, with a slightly longer straight terminal awn; palea equal to lemma, rigid, truncated, pectinate-ciliate with rather distant, forward-pointing teeth along the upper margins; anthers minute, \pm 0.3-0.4 mm. long, broadly oblong.

[In Ewart's *Flor. Vict.* 149 (1931) Morris has recorded the Eurasian *B. pinnatum* (L.) Pal. Beauv. and *B. sylvaticum* (Huds.) Pal. Beauv.—Heath and Slender False-brome respectively—as naturalized in N.E. Victoria. These two records were based on examples from C. Walter's herbarium, both labelled "Goulburn, Nov. 1900"

and of dubious origin. Apart from a second fragment of *B. pinnatum* ("Dookie, Dec. 1905"), there are no other Australian collections of either species in Melbourne Herbarium, and the writer has never observed these plants growing spontaneously (or cultivated) anywhere in Victoria.]

Tribe HORDEEÆ

88. AGROPYRON J. Gaertn. (1770)

1. Lemmas tapering into slender, finally divergent awns 1-2" long; spikelets large, few, usually distant, each with 6-12 florets (glabrous to very hairy, tufted perennial 1-3 ft. high):

220. *A. scabrum* (Labill.) Pal. Beauv. *Ess. Agrost.* 102 (1812).

Festuca scabra Labill. *Nov. Holl. Plant. Specim.* 1: 22, t. 26 (1805).

Illust.: Labillardière (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 58 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 187 (1943); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 79 (1923); Buchanan *Indig. Grasses N.Z.* t. 57 (1880), as "*Triticum scabrum*".

Vern.: Common Wheat-grass. *Distr.*: Frequent over a wide range of habitats almost throughout Victoria (Mallee, northern and western plains, coastal areas, mountain forests and alps); all States, N.Z.

—Lemmas awnless or with short awns <1 cm. long 2

2. Plants tufted or very shortly rhizomic; inflorescence \pm hairy, either congested and <2" long or loose with widely-spreading to \pm reflexed spikelets (alpine or rock-loving grasses) 4

Plants with long-creeping rhizomes; spikelets rigidly erect, on a glabrous spike >2" long 3

3. Leaf-blades glabrous above or with minute scattered hairs, bearing caliper-like auricles at base; spike slender, dull green, with acuminate or awned glumes <2 mm. wide and a tough persistent axis (widespread weed of heavier soils):

221. **A. repens* (L.) Pal. Beauv. *Ess. Agrost.* 102, t. 20 fig. 2 (1812).

Triticum repens L. *Spec. Plant.* 1: 86 (1753).

Illust.: Palisot de Beauvois (*l.c.*); Morris in Ewart, *Flor. Vict.* fig. 119 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 107 (1940); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 76 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 307 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 569 (1923); Herter, *Flor. il. Uruguay* 1: fig. 257 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3229, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1211 (1931); Coste, *Flor. Franc.* 3: fig. 4237 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 40 fig. 2 (1908); Reichenbach, *Icon. Flor. germ.* 1: t. 20 (1834).

Vern.: English Couch (Twitch, Quick-grass, Quack-grass). *Distr.*: Indigenous to most of Europe and temperate Asia; introduced into N. & S. Amer., N.Z., all Australian States except Qd (?) and scattered through Victoria where locally a persistent weed on heavy cultivated land (e.g. Melbourne, Torquay, Natimuk, Dimboola, Creswick, Cobungra).

—Leaf-blades minutely but *densely hairy* above (on the prominent ribs), *without auricles*; spike stout, *glaucous*, with *obtuse* glumes 2-4 mm. wide, the axis *fragile* and readily breaking up between the spikelets (wholly bluish-grey plants of coastal sands, tolerating salt-water and useful for sand-binding):

222. **A. junceum* (L.) Pal. Beauv. *Ess. Agrost.* 102 (1812).

Triticum junceum L. *Cent. 1 Plant.* 6 (1755).

Illust.: Koppel, *Flor. Israel*: t. 104 (1956); Nevski, *Flor. U.R.S.S.* 2: t. 47 fig. 1 (1934); Coste, *Flor. Franc.* 3: fig. 4243 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1394 (1834).

Vern.: Sea Wheat-grass (Sea Couch). *Distr.*: Indigenous to coasts of the Mediterranean and Black Seas; introduced into N. Amer. (west coast) and Victoria where now well-established at several places on the sandy shores of Port Phillip Bay (Beaumaris, Seaholme, St. Leonards, Queenscliff), its long stout rhizomes growing out onto beaches within tidal influence.

[In *Flor. Brit. Isles* 1462 (1952), Clapham, Tutin and Warburg have established the name *A. junceiforme*, based upon *Elytrigia junceiformis* A. & D. Löve in *Rep. univ. Inst. appl. Sci., Dep. Agric. Reykjavik* ser. B, 3: 106 (1948), for the Western European (and British) populations that Simonet and Guinocet had distinguished as *A. junceum* subsp. *boreo-atlanticum*. Simonet in *Bull. Soc. bot. Franc.* 82: 626 (1935) pointed out the differences purporting to separate this subspecies from the typical or Mediterranean form of the species (having more robust stature, longer spikes 10-50 cm., and larger more pointed spikelets 15-25 mm. long), but the present writer is not satisfied that such a line of demarcation can be drawn. In any event, the population now naturalized around Victorian coasts appears closer to the Mediterranean—thus typical—form of *A. junceum*.]

4. Leaves *rigid*, \pm *erect*, culm <1 ft. high; spikelets *crowded*, on a short stout spike 1-2" long, *erect*; glumes and lemmas *broad-lanceolate*, only slightly involute (high alpine):

223. *A. velutinum* Nees in Hook. *Lond. J. Bot.* 2: 417 (1843).

Illust.: Chambers in Maiden, *Agric. Gaz. N.S.W.* 10: t. opp. 141 (1899).

Vern.: Mountain Wheat-grass (Velvet Wheat-grass). *Distr.*: In Victoria restricted to alpine and subalpine grassland above 4000 ft. and locally rather frequent (Mt. Buffalo, Bogong High Plains, Mt. Hotham, Dargo High Plains, Nunniong Plateau); N.S.W., Tas.

—Leaves *lax*; culm 1-2 ft. high; spikelets \pm *distant*, on a spike up to 5" long, *spreading and at length reflexed*; glumes and lemmas *narrow-lanceolate*, becoming strongly involute (shaded rocky places of East Gippsland):

224. *A. pectinatum* (Labill.) Pal. Beauv. *Ess. Agrost.* 102 (1812).

Festuca pectinata Labill. *Nov. Holl. Plant. Specim.* 1: 21, t. 25 (1805).

Illust.: Labillardière (*l.c.*); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 79 (1923); Wills in Maiden, *Manual Grasses N.S.W.* t. opp. 191 (1898); Cockayne, *J. Dep. Agric. N.Z.* 3: 4-5 (1911).

Vern.: Comb Wheat-grass (Spiked Blue-grass—N.Z.). *Distr.*: Occasional on shaded escarpments and rocky defiles in East Gippsland, Victoria (Nowa Nowa, Buchan & Snowy Rivers, Wulgulmerang, Suggan Buggan, Upper Genoa R.); N.S.W., Tas., introduced into both islands of New Zealand.

[Miss J. W. Vickery in *Contr. N.S.W. Herb. 1*: 340-342 (1951) restricts *A. pectinatum* to Tasmania, and describes the mainland populations (hitherto so referred) as a new species, *A. retrofractum*, presumed to differ in its much less hairy (or even glabrous) lemmas with shorter awns (to 3 mm.), the glumes *alone* strongly deflexing and with manifestly chartaceous margins, the hairs on *both* rachis and upper part of culm directed downwards. However, certain collections from eastern Victoria have the hair arrangement more as in typical *A. pectinatum* (directed *upwards* along the rachis), and it is here considered preferable to treat *A. retrofractum* as a geographical variant of the former than as a distinct species. Morris in Ewart's *Flor. Vict.* 204 (1931) records the Eurasian *A. caninum* (L.) Pal. Beauv. (Bearded Couch or Fibrous Wheat-grass) for north-eastern Victoria—apparently on the basis of a single dubious collection from C. Walter's herbarium labelled "Goulburn, 1902". This species has never been observed by recent collectors throughout the State. S. A. Nevski, in *Acta Univ. Asiæ Med.* ser. 8 b (Bot.) 17: 56 (1934), replaced *Agropyron* "sensu lato" by five derivative genera. According to his revision, Victorian representatives would be assigned to the genera *Anthosachne*, *Elytrigia* and *Rægnieria*; but the differentiating criteria emphasized by Nevski are no more than those occurring within other such natural genera as *Poa*, *Festuca* and *Eragrostis*, so *Agropyron* is here retained in its traditional broader sense.]

89. *TRITICUM L. (1753)

225. *T. æstivum L. *Spec. Plant. 1*: 85 (1753).

T. sativum Lam. *Flor. Franc. 3*: 625 (1778) pro parte;

T. vulgare Vill. *Hist. Plant. Dauph. 2*: 153 (1787).

Illust.: Gardner, *Flor. W. Aust. 1*¹ (Gramineæ): t. 59 fig. A (1952), as "*T. vulgare*"; Black, *Flor. S. Aust.* ed. 2: fig. 185 (1943); Morris in Ewart, *Flor. Vict.* fig. 121 D & F (1931), as "*T. sativum*"; Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 42 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 383 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 328 (1951); Herter, *Flor. il. Uruguay 1*: fig. 263 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg. 12*: fig. 3224, col. (1934), as "*T. vulgare*"; Coste, *Flor. Franc. 3*: fig. 4229 (1906), as "*T. sativum*"; Pfenninger in Hegi, *Ill. Flor. Mittel-Eur. 1*: t. 41 fig. 4, 5, 8 & 14, col. (1908), as "*T. vulgare*".

Vern.: Wheat (Common or Bread Wheat). *Distr.*: Origin unknown, but cultivated throughout the Near and Middle East for several millennia, and now one of the most important cereal crop-plants of the world. It is the principal cereal of Australia, and often appears wherever wheat grains are dropped accidentally (railway tracks and yards, rubbish-tips, suburban allotments, etc.), but the plant seldom perpetuates itself under these conditions.

Diagn.: Erect, robust annual attaining heights to 5 ft.; leaf-blades flat, glabrous, 6-12" long, up to 15 mm. wide; ligule a membranous rim 1-2 mm. high; spikelets 3- to 5-flowered, \pm 1 cm. long and almost as broad, congested to form a \pm 4-angled spike 3-6" long, 1 or 2 upper florets usually barren; glumes equal, 5-7 mm. long, oblong, convex, blunt to shortly awned; lemma also 5-7 mm. long, convex, 7-nerved, either mucronate or prolonged into an awn up to 4" long, hardened and shining in fruit; anthers \pm 1.5 mm. long; grains 2-3 per spikelet, yellowish, 5-7 mm. long.

90. *SECALE L. (1753)

226. **S. cereale* L. *Spec. Plant.* 1: 84 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 58 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 189 (1943); Morris in Ewart, *Flor. Vict.* fig. 120 (1931); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 384 fig. D-E (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 331 (1951); Herter, *Flor. il. Uruguay* 1: fig. 267 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3220, col. (1934); Coste, *Flor. Franc.* 3: 4219 (1906).

Vern.: Rye. *Distr.*: Indigenous to southern Europe and Asia, and perhaps derived from the Mediterranean perennial *S. montanum* Guss.; widely cultivated for bread-making in northern Europe, introduced into many parts of the world (India, China, N. & S. Amer., N.S.W., S.A., W.A.) and in Victoria planted as a sand-binder and for early green feed in parts of the Mallee, e.g. Ouyen district.

Diagn.: Erect, rather slender annual to 5 ft. high; leaf-blades flat, glabrous, $\pm 6''$ long, up to 8 mm. wide; ligule a membranous rim ± 1 mm. high, soon torn; spike 3-6" long, finally drooping, always bearded with awns; spikelets with 2 equal fertile flowers; glumes equal, linear to subulate, 7-10 mm. long, keeled; lemma narrow, 12-15 mm. long, stiffly ciliate along the prominent keel, tapering into a long slender awn (1-2" long); palea equal to lemma, awnless; anthers comparatively very large, 6-10 mm. long.

91. *Elymus L. (1753)

Culm 2-6 ft. high, >3 mm. wide; spike 5-14" long, 1-2.5 cm. wide; spikelet 1.5-3 cm. long; glumes lanceolate, with \pm smooth margins; lemmas hairy:

227. **E. arenarius* L. *Spec. Plant.* 1: 83 (1753).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 123 (1931); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 84 (1954); Herter, *Flor. il. Uruguay* 1: fig. 281 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3219, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1206 (1931); Coste, *Flor. Franc.* 3: fig. 4218 (1906); Hegi, *Ill. Flor. Mitt.-Eur.* 1: t. 39 fig. 3 (1908); Reichenbach, *Icon. Flor. germ.* 1: t. 10 (1834).

Vern.: Lyme Grass (Sand Lyme-grass). *Distr.* Indigenous to the shores of N. & N.W. Europe; introduced as a sand-binder in the Mediterranean, S. Amer. and Victoria where now naturalized but of limited occurrence at Queenscliff and Portland.

Culm <2 ft. high, <2 mm. wide; spike $<5''$ long, 3-5 mm. wide; glumes subulate, awn-like, scabrid above; lemmas glabrous or almost so:

228. **E. multicaulis* Kar. & Kir. in *Bull. Soc. Nat. Moscou* 1841: 868 (1841).

Illust.: Nevski, *Flor. U.R.S.S.* 2: t. 50 fig. 1 (1934), as "*Aneurolepidium multicaule*".

Vern.: Siberian Wild-rye. *Distr.*: Indigenous to Siberia, from the Caspian and Aral to the Altai region; introduced into Victoria where occasional in the Cohuna district.

[S. A. Nevski in *Flor. U.R.S.S.* 2: 708 (1934) made the new combination *Aneurolepidium multicaule*; but his division of *Elymus* into segregate genera does not seem to be generally accepted.]

92. *HORDEUM L. (1753)

1. Culm stout, 2 ft. high or more; rhachis *continuous and persistent*; awns 2-6" long; lemma of central spikelet (excluding awn) about 1 cm. long:

229. *H. vulgare L. *Spec. Plant. 1*: 84 (1753).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 384 fig. A-B (1954); Hitchcock, *Manual Grasses U.S. ed. 2*: fig. 369 (1951); Herter, *Flor. il. Uruguay 1*: fig. 279 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg. 12*: fig. 3215, col. (1934); Coste, *Flor. Franc. 3*: fig. 4210 (1906).

Vern.: Barley ("Four-rowed" and "Six-rowed" Barley). *Distr.*: Indigenous to Eurasia; cultivated for grain almost throughout temperate parts of the world and, as with *Triticum aestivum*, often spontaneous for a period but seldom persisting longer than one or two seasons (India, China, N. & S. Amer., Tas., N.S.W., Qd, S.A. and various parts of Victoria).

—Culm < 2 ft. high; rhachis fragile, readily disarticulating; awns and central lemmas shorter than in the above 2

2. Awns of all 3 lemmas *much longer* (up to 2") than those of the 6 glumes; glumes of at least the central spikelet *dilated and ciliate*; lemmas \pm *chartaceous*, 1-2 mm. wide, those of the lateral spikelets (even excluding awns) *longer and wider* than central lemma:

230. *H. leporinum Link in *Linnæa* 9: 133 (1834-35)

H. murinum sens. Morris in Ewart *Flor. Vict.* 207 (1931), atque auctt. Aust. al., non L. (1753).

Illust.: Gardner, *Flor. W. Aust. 1¹* (Gramineæ): t. 59 fig. B (1952); Black, *Flor. S. Aust. ed. 2*: fig. 188 (1943); *Wild Life* 4: 420, 422 (1942); Morris in Ewart, *Flor. Vict.* fig. 122 (1931); Chambers in Maiden, *Agric. Gaz. N.S.W. 15*: t. opp. 924 (1904); Hitchcock, *Manual Grasses U.S. ed. 2*: fig. 368 (1951); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg. 12*: fig. 3214, col. (1934)—all except the last two (Hitchcock, Bonnier) as "*H. murinum*".

Vern.: Barley-grass. *Distr.*: Indigenous to the Mediterranean region; introduced into S. Afr., N. Amer., N.Z., all Australian States and a frequent weed of settlement and pasture land in many parts of Victoria (at such widely separated places as Port Phillip Bay, Torquay, Creswick, St. Arnaud, Dimboola & Little Desert, Wyperfeld Nat. Park, extreme North-west, Graytown, Cornishtown and Suggan Buggan).

[The closely related Eurasian *H. murinum* L. (Wall Barley) differs in having lateral spikelets *no longer or wider* than the central one.]

—Awns of at least the 2 lateral lemmas *shorter* (<1") than those of glumes; glumes *all hairless, not dilated*; lemmas hard and \pm *horny*, <1 mm. wide, those of lateral spikelets *no longer or wider* than central lemma:

231. *H. hystrix Roth *Catal. bot. 1*: 23 (1797).

H. maritimum sens. Morris in Ewart *Flor. Vict.* 208 (1931), atque auctt. Aust. al., non With. (1787).

Illust.: Hitchcock, *Manual Grasses U.S. ed. 2*: fig. 367 (1951).

Vern.: Mediterranean Barley-grass. *Distr.*: Indigenous to the Mediterranean region; introduced into N. Amer., N.Z., all Australian States except Qd (?) and a widely distributed weed of sandy—and sometimes saline—ground in western Victoria (Port Phillip Bay, Anglesea, Colac, Upper Glenelg R., Little Desert, Red Cliffs, Graytown, Ancona), with scattered occurrences in East Gippsland (Junction of Snowy R. and Brodribb R.), Baddaginnie & Warby Range.

[The closely related West and South European *H. maritimum* Huds. (Sea Barley or Squirrel-tail Grass), *H. maritimum* With. being synonymous, differs in having one glume of each lateral spikelet broadly winged along one side. J. M. Black in his *Flor. S. Aust.* ed. 2: 137 (1943) accurately defines and records this grass from several parts of South Australia, but no genuine occurrence is yet known in Victoria. Morris (*l.c.*) records *H. nodosum* L. (Meadow Barley or Knotted Barley-grass) as "occasionally a weed of cultivation" in Victoria; but this grass apparently fails to persist and is seldom seen here—Melbourne Herbarium has only two collections for the present century, viz. Geelong (1910) and from a garden at Hamilton (Apr. 1960). It is distinguished by very narrow spikes—less than 1.5 cm. wide (usually ± 8 mm.)—and scabrid bristle-like glumes; the correct name is *H. secalinum* Schreb.]

Tribe MONERMEÆ

93. *MONERMA Pal. Beauv. (1812)

232. **M. cylindrica* (Willd.) Coss. & Durieu *Explor. sci. Algérie (Bot.)* 2: 214 (1855).

Rottboellia cylindrica Willd. *Spec. Plant.* 1: 464 (1797);

Lepturus cylindricus (Willd.) Trin. *Fund. Agrost.* 123 (1820).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 118 (1931), as "*Lepturus cylindricus*"; Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 45 (1955); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 75 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 373 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 564 (1923), as "*Lepturus cylindricus*"; Herter, *Flor. il. Uruguay* 1: fig. 355 (1941), as "*Lepturus cylindricus*"; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belge* 12: fig. 3246, col. (1934), as "*Lepturus cylindricus*"; Coste, *Flor. Franc.* 3: fig. 4259 (1906), as "*Lepturus cylindricus*"; Paliset de Beauvois, *Ess. Agrost.* t. 20 fig. 10 (1812), as "*M. monandra*".

Vern.: Common Barb-grass (Thin Tail—U.S.A.). *Distr.*: Indigenous to the Mediterranean region; introduced into Britain, S. Afr., N. & S. Amer., N.Z., all Australian States except Qd (?) and in Victoria scattered through sandy terrain in the lowlands (Port Phillip Bay, Skipton, Hawkesdale, Grampians, Dimboola, Swan Hill, Ravenswood, Dookie, Cowes on Phillip Id, Gabo Id).

Diagn.: Stiff annual to 1 ft. (rarely more) in height; leaf-blades flat or \pm involute, to 5" long (but usually ± 2 "), ± 2 mm. wide, glabrous, long-acuminate; ligule membranous, to 1 mm. high; spike rigid, 2-8" long, 1-2 mm. thick, straight or slightly curved; spikelets 1-flowered, sessile, distichous, half embedded in alternate notches of the hard, articulate, \pm cylindric rhachis; glume solitary (except in terminal flower where sometimes 2), hard, 6-7 mm. long, 5-nerved, linear-lanceolate, at first tightly appressed and closing cavity of rhachis but later spreading at an angle of $\pm 45^\circ$; lemma and palea also ± 6 mm. long, whitish; anthers slender, 2-3 mm. long.

94. **PARAPHOLIS* C. E. Hubbard (1946)

Culms <4" high; uppermost leaf-sheath prominently *dilated*; spikes \pm arcuate (sometimes curved in a half-circle), usually purplish; glumes *erect*, rarely slightly spreading, 4-6 mm. long, manifestly exceeding the lemma; anthers <1 mm. long:

233. **P. incurva* (L.) C. E. Hubbard in *Blumea* Suppl. 3: 14 (1946).

Aegilops incurva L. *Spec. Plant.* 2: 1051 (1753);

Lepturus incurvatus Trin. *Fund. Agrost.* 123 (1820).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 55 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 186 (1943), as "*Pholiurus incurvus*"; Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 112 (1940), as "*Pholiurus incurvus*"; Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 316 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 76 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 374 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 565 (1923), as "*Pholiurus incurvus*"; Herter, *Flor. il. Uruguay* 1: fig. 356 (1941), as "*Pholiurus incurvus*"; Poincot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3247, col. (1934), as "*Lepturus incurvatus*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1204 (1931), as "*Lepturus incurvus*"; Coste, *Flor. Franc.* 3: fig. 4260 (1906), as "*Lepturus incurvus*"; Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 39 fig. 4 (1908), as "*Lepturus incurvus*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1333 (1834), as "*Lepturus incurvus*".

Vern.: Coast Barb-grass (Curved Sea Hard-grass, Sickie Grass—U.S.A.). *Distr.*: Indigenous to Mediterranean and W. Europe; introduced into India, S. Afr., N. & S. Amer., N.Z., all Australian States except Qd (?) and in Victoria scattered on sandy, often saline, soils, chiefly in the west (Port Phillip Bay, Cape Schanck, Anglesea, Creswick, Dimboola, Far North-west) but also at Doughboy Id near Wilson Prom. and at Mallacoota.

Culms >5" high; leaf-sheaths *never dilated*; spikes all *straight*, rigidly erect, usually green; glumes *spreading* at an angle of $\pm 30^\circ$ to rhachis at maturity, 4-6 mm. long, hardly exceeding lemma; anthers 2-4 mm. long:

234. **P. strigosa* (Dumort.) C. E. Hubbard in *Blumea* Suppl. 3: 14 (1946).

Lepturus strigosus Dumort. *Obsns Gram. Flor. belg.* 146 (1823);

L. incurvus sens. Morris in Ewart *Flor. Vict.* 202 (1931) pro parte, non Trin. (1820).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 314 (1954); Coste, *Flor. Franc.* 3: fig. 4261 (1906), as "*Lepturus filiformis*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1334 (1834), as "*Lepturus filiformis*".

Vern.: Slender Barb-grass (Sea Hard-grass). *Distr.*: Indigenous to W. Europe (from Scandinavia to Portugal), usually bordering coastal salt-marshes; introduced and naturalized at a few places in western Victoria (Seaholme on Port Phillip Bay, Borung Shire, and Ned's Corner on Murray R. in the Far North-west), but probably overlooked through its great superficial similarity to *Monerma cylindrica*.

[British specimens of *P. strigosa* were distributed from Kew Herbarium in 1938, under the name "*Pholiurus filiformis* (Roth) Schinz & Thellung", and are identical with Victorian material of the former species—at present not recorded from any other Australian State. In *Contr. N.S.W. Herb.* 1: 279 (1950) J. W. Vickery has

recorded *P. filiformis* (Roth) C. E. Hubbard as naturalized in New South Wales, perhaps through confusion of this Mediterranean species with West European *P. strigosa*—*P. filiformis* is at once distinguishable by a prominent *hyaline wing* along the keels of the two outer glumes, a feature lacking in all populations of *P. strigosa*.]

95. **PSILURUS* Trin. (1820)

235. **P. incurvus* (Gouan) Schinz & Thell. in *Vjschr. naturf. Ges. Zürich* 58: 40 (1913).

Nardus incurvus Gouan *Hort. reg. monspel.* 33 (1762).

Illust.: Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3248, col. (1934); Coste, *Flor. Franc.* 3: fig. 4262 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1332 (1834)—all as "*Psilurus nardoides*".

Vern.: Bristle-tail Grass. *Distr.*: Indigenous to the Mediterranean region, Balkans, Caucasus and W. Asia; introduced into N.S.W., S.A. and Victoria where at present restricted to the Wimmera (Mt. Arapiles, Oct. 1949).

Diagn.: Small glabrous annual; culms filiform, leafy toward base; leaf-blades 1-3 cm. long (rarely more), very narrow and involute; ligule minute, membranous, ± 0.5 mm. high; spike 2-8" long, extremely slender (< 1 mm. thick); spikelets 1-flowered, sessile, distichous, hidden in the rather distant alternate notches of the rhachis; glume solitary, minute (± 1 mm. long), ovate, acute; lemma facing and closing hollow along rhachis, rigidly coriaceous, linear, ± 4 mm. long, tapering into a bristle-like awn 2-3 mm. long; palea 3-4 mm. long, strongly ciliate on nerves; stamen solitary with dark purplish, slender anther 2-3 mm. long.

Tribe AVENEÆ

96. **AVENA* L. (1753)

1. Lemma always *glabrous*, *shortly bidentate* at apex; column of awn (if present) *not* or scarcely twisted; upper floret tardily disarticulating from spikelet, which is ± 1 " long:

236. **A. sativa* L. *Spec. Plant.* 1: 79 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 9 fig. c (1952); Adams in Connor, *Bull. Dep. sci. industr. Res., N.Z.* 99: fig. 37 B (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 387 (1923); Herter, *Flor. il. Uruguay* 1: fig. 367 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3105, col. (1934); Coste, *Flor. Franc.* 3: fig. 4055 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 30 fig. 1 (1907).

Vern.: Oat. *Distr.*: Origin uncertain, but most probably a derivative of *A. fatua* in the Mediterranean region, and occasionally hybridizing with that species; widely cultivated for grain and horse-feed throughout temperate regions of the world, including all Australian States, and often spontaneous for a season or two in parts of Victoria (in such widely separated places as Melbourne, St. Leonards, Ballarat, Dimboola, Little Desert, Graytown, Bogong High Plains).

—Lemma bearing few to many *long spreading hairs* or, if ever glabrous, then with long awn-like points; column of awn \pm twisted 2

2. Apex of lemma with 2 fine awns or bristles 3-7 mm. long 4

—Apex of lemma shortly toothed but *not* awned (the lower part densely hairy)

3. Glumes about 1" long; awns <2" long; upper floret *with a scar* at base, disarticulating readily (if present, the third lemma is *awned*):

237. **A. fatua* L. *Spec. Plant.* 1: 80 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 9 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 128 (1943); Carn, *Control of Weeds*, N.S.W. 31 (1939); Morris in Ewart, *Flor. Vict.* fig. 115 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 115 (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 51 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 212 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 407 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 386 (1923); Herter, *Flor. il. Uruguay* 1: fig. 366 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3104, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1196 (1931); Coste, *Flor. Franc.* 3: fig. 4053 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 101 (1907).

Vern.: Wild Oat (Black Oat, Spring Oat). *Distr.*: Probably indigenous to the Mediterranean region, but naturalized for many centuries throughout most of Europe, North Africa and Central Asia; introduced, as a frequent weed among cereal crops and on waste land, in S. Afr., N. & S. Amer., N.Z., all Australian States, and in such dispersed Victorian localities as Melbourne, Dandenongs, Frankston, St. Leonards, Torquay, Brisbane Range, Colac, Wannon Falls, Little Desert, Kulkyn Nat. Forest, Nathalia, Cornishtown, Baw Baws.

—Glumes >1" long; awns 2-3" long; upper floret *not* scarred at base, not or only tardily disarticulating (the third lemma *awnless*):

238. **A. sterilis* L. *Spec. Plant.* ed. 2, 1: 118 (1762).

Illust.: Herter, *Flor. il. Uruguay* 1: fig. 371 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3103, col. (1934); Coste, *Flor. Franc.* 3: fig. 4054 (1906); Roshevitz in Komarov, *Flor. U.R.S.S.* 2: t. 20 fig. 17 (1934); Javorka & Csapody, *Icon. Flor. Hungar.* 25 (1929); Reichenbach, *Icon. Flor. germ.* 1: fig. 1711 (1834).

Vern.: Sterile Oat (Animated Oat). *Distr.*: Indigenous to southern, central and eastern Europe; introduced into S. Amer., N.S.W. and Victoria where occasional on banks of the Yarra R. (notably at Studley Park), Blackburn etc. in the Melbourne area.

4. Lemmas disarticulating *readily*, copiously *hairy* below (panicle \pm one-sided):

239. **A. alba* Vahl *Symb. Bot.* 2: 24 (1791).

**A. barbata* Pott ex Link in Schrad. *J. Bot., Göttingen* 2: 315 (1799), atque Brot. *Flor. lusit.* 1: 108 (1804).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 9 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 128 (1943); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 408 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 388 (1923); Herter, *Flor. il. Uruguay* 1: fig. 365 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3104 b, col. (1934); Coste, *Flor. Franc.* 3: fig. 4052 (1906)—all as "*A. barbata*".

Vern.: Bearded Oat. *Distr.*: Indigenous to the Mediterranean regions; introduced into S. Afr., India, Malaya, N. & S. Amer., N.S.W., S.A., W.A. and an occasional weed in scattered parts of Victoria (Melbourne, Wail near Dimboola, Graytown, Lakes Entrance).

—Lemmas *tardily* breaking free, glabrous or with a few scattered hairs in upper part:

240. **A. strigosa* Schreb. *Spicik. Flor. lips.* 52 (1771).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 210 (1954); Herter, *Flor. il. Uruguay I*: fig. 364 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3105 d, col. (1934); Coste, *Flor. Franc.* 3: fig. 4058 (1906); Hegi, *Ill. Flor. Mittel-Eur. I*: fig. 102 (1907); Reichenbach, *Icon. Flor. germ. I*: fig. 1710 (1834).

Vern.: Bristle Oat (Sand Oat). *Distr.*: Indigenous to southern Europe (occasionally cultivated in E., Cent. & W. Europe, including western Britain); introduced into S. Amer., N.Z. and Victoria where a casual, uncommon weed (Balliang near Bacchus Marsh, Ballarat—cultivated 1939).

[The two last species, known only by a few transitory occurrences in Victoria, do not seem to be thoroughly naturalized. They are very similar in appearance, and *A. alba* has been treated as a subspecies of *A. strigosa*; the former has a diploid chromosome number of 28, the latter of only 14. Hybridism is known between various species of *Avena* in the Northern Hemisphere, and doubtless also complicates the identification of some populations in Australia.]

97. AMPHIBROMUS Nees (1843)

1. Awn *straight*, pale, hair-like, 12-16 mm. long, the column *not twisted*; spikelet 5- to 10-flowered; glumes subequal, \pm 3 mm. long; lemma \pm 4 mm. long, minutely scabrid, rather *regularly bidentate* at summit and awned from middle; hair-tuft on callus *microscopic or absent* (leaf-sheaths \pm scabrid):

241. *A. gracilis* P. F. Morris in *Vict. Nat.* 51: 145, t. 26 fig. 5 (1934).

Illust.: Morris (*l.c.*).

Vern.: Graceful Swamp Wallaby-grass. *Distr.*: Known only from the type area near Melbourne in southern Victoria (viz. Yarra River flats between East Kew, North Balwyn and Heidelberg), at Walwa on the Upper Murray and in the Albury district, N.S.W.—where not uncommon as “semi-prostrate masses in mud of lagoons”, *teste* E. J. McBarron, *Contr. N.S.W. Herb.* 2: 120 (1955).

[As pointed out under the original description (*l.c.* 146), the species is extremely close to New Zealand *A. fluitans* T. Kirk, from which it seems to depart only in the more scabrous leaves and lemmas and rather more flowers per spikelet. It could well represent an Australian variant of *A. fluitans*, and the few known localities (chiefly near metropolitan areas) even suggests the possibility of introduction.]

—Awn \pm *bent*, with *twisted column*, sometimes reddish-brown; hair-tuft on callus 0.5-2 mm. long (spikelet never > 7-flowered)

2. Glumes very *unequal*, the upper 6-8 mm. long; body of lemma 8-10 mm. long, the 4 lateral nerves protruding as *two long* (2-3 mm.) bristle-like teeth or awns and *two much shorter* teeth; central awn *massive*, ± 0.2 mm. wide at base, 15-17 mm. long, usually dark, bent or arcuate through $>90^\circ$; hair-tuft on callus *large*, 1-2 mm. long (spikelet 2- to 4-flowered):
242. *A. archeri* (Hook. f.) P. F. Morris in *Vict. Nat.* 51: 146, t. 26 fig. 2-3 (1934).
Danthonia archeri Hook. f. *Flor. Tasm.* 2: 122 (1858), t. 163 fig. A, col. (1859).
Illust.: Fitch in Hooker f. (*l.c.*); Morris (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 50, 132 (1943).
Vern.: Pointed Swamp Wallaby-grass. *Distr.*: In Victoria known only from swampy ground at Oakleigh (where probably now extinct), near foot of Mt. Macedon, Campaspe R. and Echuca, Ballarat district, Meipol in the north-east (1939); also in S.A. (Mt. Lofty Range, Encounter Bay) and Tas.
 [Victorian and South Australian material of *A. archeri* is apparently all referable to the var. *papillosus* P. F. Morris (*l.c.* 147), having lemmas distinctly papillose on the back.]
- Glumes *subequal*, the upper <6 mm. long; body of lemma <8 mm. long; if nerves protruding, then with equal points; awn slender, not bent beyond 90° ; hair-tuft on callus 0.5-1 mm. long 3
3. Panicle *very loose*; lower glume 4-5 mm. long; lemma *irregularly toothed* or erose at apex, the major lobes <1 mm. long; awn usually pale-brownish, arising *just above the middle*:
243. *A. neesii* Steud. *Synops. Plant. glumac.* 1: 328 (1854).
A. nervosus J. M. Black in *Flor. S. Aust.*: 73 (1922);
Avena nervosa R. Br. *Prodr. Flor. Nov. Holl.* 178 (1810), *non* Lam. (1791).
Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 8 (1952); Black, *Trans. roy. Soc. S. Aust.* 61: t. 14 fig. 3 (1937); Morris, *Vict. Nat.* 51: t. 26 fig. 4 (1934); Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. opp. 561 (1891); Fitch in Hooker f., *Flor. Tasm.* 2: t. 163 B, col. (1859), as "*Danthonia nervosa*".
Vern.: Swamp Wallaby-grass. *Distr.*: Not uncommon on wet ground beside streams, lagoons, ponds, etc. almost throughout Victoria (e.g. Melbourne, St. Leonards, Creswick, Bendigo, St. Arnaud, Mt. Cole, Upper & Lower Glenelg R., Dimboola, Serviceton, Kulkyn Nat. Forest, Nathalia, Graytown, Drouin, Cann R.), but not in alps; all States except Qd (?).
- Panicle narrow, *rather dense*, often purplish; lower glume 3-4 mm. long; lemma terminating in 4 acute *equal* teeth (± 1 mm. long) with percurrent nerves; awn *dark purplish-brown*, arising in the *upper third*:
244. *A. recurvatus* J. R. Swallen in *Amer. J. Bot.* 18: 413 (1931).
Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 131 (1943); Morris, *Vict. Nat.* 51: t. 26 fig. 1 (1934).
Vern.: Dark Swamp Wallaby-grass. *Distr.*: In Victoria restricted to the far south-western region (Gorae West near Portland, 1947) where occasional; also in S.A. (Mt. Burr-Mt. Gambier district) and Tas. (Mt. Field Nat. Park).

98. *ARRHENATHERUM Pal. Beauv. (1812)

245. *A. elatius (L.) J. & C. Presl *Flor. cech.* 17 (1819).*Avena elatior* L. *Spec. Plant.* 1: 79 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1^a (Gramineæ): t. 10 fig. A-H (1952); Black, *Flor. S. Aust.* ed. 2: fig. 129 (1943); Morris in Ewart, *Flor. Vict.* fig. 107 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 113 (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 52 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 208 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 412 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 389 (1923); Herter *Flor. il. Uruguay* 1: fig. 359 (1941); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3106, col. (1934), as "*Avena elatior*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1199 (1931); Coste, *Flor. Franc.* 3: fig. 4080 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 30 fig. 3 (1907); Reichenbach, *Icon. Flor. germ.* 1: t. 104 (1834), as "*A. avenaceum*".

Vern.: False Oat-grass. *Distr.*: Indigenous to Europe and W. Asia; introduced into S. Afr., N. & S. Amer., N.Z., all Australian States except Qd (?), and occasional as a troublesome weed of well-watered districts in Victoria where difficult to eradicate from arable ground (Warrnambool, Clunes, Castlemaine, Daylesford, Heathcote, Dandenongs, Traralgon, Mirboo North, Swift's Creek).

Diagn.: Robust perennial with deep yellowish roots, frequently provided with chains of detachable and bulbous basal internodes which serve to spread the plant; culms erect, 3- to 5-noded, 2-5 ft. high, glabrous or \pm hairy at nodes; leaf-blades 4-16" long, 4-10 mm. wide, finely pointed, flat, glabrous or occasionally rough with scattered hairs above; ligule membranous, truncate, 1-3 mm. long; panicle 4-12" long, rather loose, erect or \pm nodding, lustrous, green or purplish, the branches clustered and scabrid pedicels 1-10 mm. long; spikelet oblong or gaping, 7-11 mm. long, 2-flowered (rarely with 3-4 florets), the lower flower usually male and falling with upper bisexual one attached; glumes persistent, unequal, the lower 6 mm. long and 1-nerved, the upper 9 mm. long and 3-nerved; lemmas 8-10 mm. long, ovate-lanceolate, firm, 7-nerved, shortly bearded at base, the lower with a bent awn 10-17 mm. long arising near middle of rounded back, the upper awnless or with short bristle from near tip; paleas \pm 8 mm. long, with minutely hairy keels; anthers 4-5 mm. long.

[Victorian populations are chiefly referable to the var. *bulbosum* (Willd., ut *Avena*) Spenner *Flor. friburg.* 1: 113 (1825), distinguished by the swollen *tuberiform* basal internodes and sometimes called "Onion Couch".]

99. *GAUDINIA Pal. Beauv. (1812)

246. *G. fragilis (L.) Pal. Beauv. *Ess. Agrost.* 95 (1812).*Avena fragilis* L. *Spec. Plant.* 1: 80 (1753).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 113 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3242, col. (1934); Coste, *Flor. Franc.* 3: fig. 4083 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 30 fig. 4 (1907); Reichenbach, *Icon. Flor. germ.* 1: t. 13 (1834).

Vern.: Fragile Oat. *Distr.*: Indigenous to the Mediterranean region; introduced into Victoria, where occasional and localized in south-western districts (Warrnambool, Glenormiston South, Bessie Belle on Eumerella R., Hamilton).

Diagn.: Slender rigid annual ± 1 ft. high (seldom to 2 ft.); leaf-blade flat, 1-3" long and 1-4 mm. wide, bearing scattered long, stiff, divergent hairs; ligule membranous, truncate, 0.5-1.0 mm. high; spike narrow, ± 6 " long; spikelets (including awns) 15-20 mm. long, rigid, erect or slightly divergent, sessile, close together in alternate notches of rachis, usually with 3 perfect flowers (the lowermost sessile) and 1 or more rudimentary florets at apex; glumes unawned, unequal, the lower to 5 mm. long, \pm pointed and with only 1 obvious nerve, the upper ± 8 mm. long, very blunt, with 5 or 7 strongly raised \pm scabrid nerves and thin hyaline margins (wide at apex); lemma and palea \pm equal to upper glume, the former with a scabrid bent awn (to 10 mm. long) rising from the upper quarter of its back; anthers 4 mm. long, narrow-linear, reddish.

100. *APELLINIA Parl. (1842)

247. *A. michelii (Savi) Parl. *Plant. nov.* 61 (1842).

Bromus michelii Savi *Bot. etrusc.* 1: 78 (1808).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 16 fig. B (1952); Morris in Ewart, *Flor. Vict.* fig. 74 (1931); Millan in Paunero, *An. Jard. bot. Madr.* 14: 235 t. 10, 251 t. 26 (1956); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3177, col. (1934); Coste, *Flor. Franc.* 3: fig. 4086 (1906), as "*Koeleria michelii*".

Vern.: APELLINIA. *Distr.*: Indigenous to the Mediterranean region and Canary Is; introduced into S.A., W.A. and Victoria where occasional on sandy ground of a few western areas (Corio, Graytown, Wail, Dimboola, Wyperfeld Nat. Park).

Diagn.: Small slender annual, several inches high; culms usually whitish-pubescent; leaf-blade \pm pubescent, 1-2" long and to 2 mm. wide (often much less), flat or becoming involute-setaceous; ligule a ring of hairs 0.3-0.5 mm. high; panicle narrow but rather loose, 1-4" long, pallid brownish; spikelet 3- to 4-flowered, ± 5 mm. long; glumes very unequal, the lower minute (1-1.5 mm. long), narrow and almost bristle-like, the upper 4-5 mm. long and equalling or exceeding flowers; lemma narrow, \pm cylindrical, 4 mm. long, with an awn ± 2 mm. long in the apical notch; palea ± 2 mm. long; anthers broadish, very small (0.5 mm. long).

101. *KOELERIA Pers. (1805)

248. *K. phleoides (Vill.) Pers. *Synops. Plant.* 1: 97 (1805).

Festuca phleoides Vill. in Gilib. *Syst. Plant. Europ.* 1: *Flor. delph.* 7 (1785).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 16 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 144 (1943); Morris in Ewart, *Flor. Vict.* fig. 72 (1931); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 379 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 384 (1923); Herter, *Flor. il. Uruguay* 1: fig. 377 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3124, col. (1934); Coste, *Flor. Franc.* 3: fig. 4087 (1906).

Vern.: Annual Cat's-tail. *Distr.*: Indigenous to the Mediterranean region, Canary Is and Azores; introduced into other parts of Europe, tropical W. Afr., S. Afr., India, N. & S. Amer., all Australian States and frequent almost throughout western Victoria (Melbourne, Point Lonsdale, Torquay, Creswick, St Arnaud, Dimboola, Little Desert, Red Cliffs, Graytown, Nathalia, Suggan Buggan, etc.).

Diagn.: Small \pm ascending annual, usually to 8" high; leaf-blade to 4" long and to 4 mm. wide (but often much smaller), flat, finely pointed, sparsely hairy; ligule to 2 mm. long, membranous, often hairy; panicle dense and spike-like, shortle oblong-ovoid to cylindrical, usually 1-3" long but sometimes much less; spikelet 3-6 mm. long (including awns), 4- to 6-flowered; glumes 3-4 mm. long, subequal, shorter than flowers, \pm sprinkled with long hairs; lemma \pm 3 mm. long, oblong, 5-nerved, papillose to nearly glabrous on back, with a straight awn 1-3 mm. long arising from the apical notch; palea 2-2.5 mm. long; anthers broadly oblong, minute (0.3-0.5 mm. long); rhachilla hairless [cf. the superficially similar *Trisetum pumilum* which has tufts of long hairs on rhachilla].

[A diminutive population, with distinctly hairy glumes and lemmas, appears referable to *K. phleoides* var. *azorensis* Domin in *Bibl. Bot., Stuttgart* Heft 65: 268 (1906); it is almost co-extensive with the more typical glabrous-flowered form in western Victoria.

Under the name "*K. cristata* Pers.", Morris in Ewart's *Flor. Vict.* 147 (1931) included the boreal Crested Hair-grass or Crested Cat's-tail (*K. gracilis* Pers.) as a naturalized plant; but only a single collection, purporting to be Victorian, exists—viz. "Goulburn, 1902" (*ex Herb. Walter*)—and the origin of this is questionable. L. Rodway (1903) recorded the same species from Macquarie Plains, Tas., but it does not seem to have been reported from any other State.]

102. *TRisetum* Pers. (1805)

Leaf-sheaths hairy; panicle <2" long, pale yellow-green; glumes very hairy, 2-3 mm. long; awn delicate, very pale, 2-3 mm. long, almost straight (small annual of drier western districts):

249. **T. pumilum* (Desf.) Kunth *Rév. Gramin.* 102 (1829).

Avena pumila Desf. *Flor. atlant.* 1: 103 (1798).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 145 (1943); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 55 (1955), as "*Trisetaria pumila*".

Vern.: Tiny Bristle-grass. *Dist.*: Indigenous to South Africa; introduced into N.S.W., S.A., W.A. and Victoria where not uncommon on seasonally damp sandy ground in the Far North-west (Kulkyne Nat. Forest, Mildura, Lake Walla-walla, etc.).

Leaf-sheaths glabrous; panicle 2-6" long, \pm tinged with purple; glumes glabrous, shining, \pm hyaline, 4-6 mm. long; awn strong, dark purplish, 5-6 mm. long, \pm bent or recurved (alpine perennial):

250. *T. spicatum* (L.) Richt. *Plant. Europ.* 1: 59 (1890).

Aira spicata L. *Spec. Plant.* 1: 63 (1753);

A. subspicata L. *Syst. Nat.* ed. 10, 2: 873 (1759);

T. subspicatum (L.) Pal. Beauv. *Ess. Agrost.* 88 (1812).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 111 (1931); Wills in Turner, *Agric. Gaz. N.S.W.* 4: t. opp. 415 (1893); Buchanan, *Indig. Grasses N.Z.* t. 40 A (1879); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 390 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 380 (1923); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3117, col. (1934); Coste, *Flor. Franc.* 3: fig. 4074 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 99 e-h (1907)—all, except Hitchcock, Abrams and Hegi, as "*T. subspicatum*".

Vern.: Bristle-grass. **Distr.:** Frequent in alpine and subalpine grassland of eastern Victoria above 4500 ft. (Mts. Buller, Buffalo, Speculation, Howitt, The Twins, Hotham & Feathertop, Bogong High Plains, Cobboras, Nunniong Plateau, near Suggan Buggan), but apparently absent from Baw Baws; N.S.W., Tas., N.Z., also high mountains of N. & S. Amer., Asia and Eur. (except Britain).

[The generic name *Trisetaria* Forsk. (1775) antedates *Trisetum* Pers. and has been adopted by Lucy K. A. Chippindall in *Grasses and Pastures of South Africa* 84 (1955); but it is here deemed desirable to retain the more widely used name *Trisetum*, until decisive rejection of proposals for its conservation.]

103. DESCHAMPSIA Pal. Beauv. (1812)

251. D. cæspitosa (L.) Pal. Beauv. *Ess. Agrost.* 91, t. 18 fig. 3 (1812).

Aira cæspitosa L. *Spec. Plant.* 1: 64 (1753).

Illust.: Palisot de Beauvois (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 127 (1943); Morris in Ewart, *Flor. Vict.* fig. 114 (1931); Burton in Maiden, *Manual Grasses N.S.W.* t. opp. 128 (1898), also in *Agric. Gaz. N.S.W.* 7: t. opp. 262 (1896); Buchanan, *Indig. Grasses N.Z.* t. 37 (1879); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 226 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 401 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 373 (1923), as "*Aira cæspitosa*"; Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3101, col. (1934), as "*Aira cæspitosa*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1191 (1931), as "*Aira cæspitosa*"; Coste, *Flor. Franc.* 3: fig. 4047 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 29 fig. 1, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: t. 96 (1834), as "*Aira cæspitosa*".

Vern.: Tufted Hair-grass. **Distr.:** Scattered and rather uncommon in alpine and subalpine grassland of eastern Victoria (above 4500 ft. at Mt. Wellington, the Benison & Bogong High Plains, but at much lower altitude near Omeo); N.S.W., S.A. (Mt. Lofty Range—rare), Tas., N.Z., widely distributed throughout the world on waterlogged moorlands but only on high mountains in tropical S. Amer., Afr. and Asia.

Diagn.: Large tussock-forming perennial with erect, rigid, smooth, 1- to 3-noded culms up to 5 ft. high; leaf-blades 4-24" long, 2-5 mm. wide, pointed or bluntish, coarse, glabrous beneath but with prominent roughly scabrid ribs and margins above, flat or \pm inrolled; ligule lanceolate, glabrous 3-6 mm. long (sometimes even to 15 mm.); panicle 4-20" long and to 8" wide, very loose and open, green or variously silver to purplish, with slender branches; spikelets \pm scattered, 2-flowered, 4-6 mm. long, narrowly oblong; glumes 3-4 mm. long, subequal, pointed, keeled, awnless, membranous, shining; lemma 3-4 mm. long, bearded at base, oblong, membranous, finely 5-nerved, with truncate denticulate apex and a fine straight awn (to 4 mm. long) from near the base; palea slightly shorter; anthers 1.5-2 mm. long.

104. *AIRA L. (1753)

Panicle broad, loose, spreading, very open and delicate (up to 10 cm. long); glumes silvery, 2 mm. long, soon widely gaping; lemmas (excluding awn) \pm 1 mm. long;

252. *A. caryophyllea L. *Spec. Plant.* 1: 66 (1753).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 109 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 116 (1940); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 232 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 404 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 376 (1940), as

"*Aspris caryophyllea*"; Herter, *Flor. il. Uruguay* 1: fig. 357 (1941); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3097, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1195 (1931); Coste, *Flor. Franc.* 3: fig. 4040 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 28 fig. 5, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1676 (1834).

Vern.: Silvery Hair-grass. *Distr.*: Indigenous to W., Cent. & S. Europe, W. Asia, N. Africa and mountains of tropical Africa; introduced into S. Afr., N. & S. Amer., N.Z., all Australian States and frequent almost throughout Victoria except in shaded mountain forests (Mallee, plain country, open woodland, coast and subalps).

[The Mediterranean species *A. cupaniana* Guss. and *A. multicaulis* Dum. are very similar to *A. caryophyllea*, but are rather larger plants with taller culms and the latter has twice as many chromosomes ($2n=28$); both may well be present in Victoria, but overlooked, and *A. cupaniana* is abundant in the Albury district, N.S.W.]

Panicle rather narrow and spike-like, erect (1-3 cm. long); glumes 3 mm. long, remaining almost erect; lemmas (excluding awn) 2 mm. long:

253. **A. præcox* L. *Spec. Plant.* 1: 65 (1753).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 234 (1954); Millan in Paunero, *An. Jard. bot. Madr.* 14: 231 t. 6 (1956); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 403 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 374 (1940), as "*Aspris præcox*"; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3096, col. (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1194 (1931); Coste *Flor. Franc.* 3: fig. 4043 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1675 (1834).

Vern.: Early Hair-grass. *Distr.*: Indigenous to N., W. and Cent. Europe, Mediterranean and Azores; introduced into N. & S. America, N.Z., Tas., N.S.W., W.A. and Victoria where an occasional annual in several districts (Melbourne, Dandenongs, Creswick, Benison & Doughboy Is near Wilson Prom.).

105. **PERIBALLIA* Trin. (1820)

254. **P. minuta* (L.) Aschers. & Graebn. *Synops. mitteleurop. Flor.* 2: 298 (1899).

Aira minuta L. *Spec. Plant.* 1: 64 (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 126 (1943), as "*Molineria minuta*"; Millan in Paunero, *An. Jard. bot. Madr.* 14: 230 t. 5 (1956); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3093, col. (1934), as "*Molineria minuta*"; Coste, *Flor. Franc.* 3: fig. 4034 (1906), as "*Airopsis minuta*".

Vern.: Small Hair-grass. *Distr.*: Native to the Mediterranean region where widespread; introduced into S. Afr., N.S.W., S.A., W.A. and western Victoria (Little Desert where not infrequent, Dimboola, Mandurang near Bendigo, Graytown).

Diagn.: Slender, glabrous annual to 4" high; culms erect; leaf-blades to 2" long (but often <1 cm.) and to 1 mm. wide, \pm involute-setaceous; ligule comparatively large, 1-1.5 mm. long, ovate, hyaline; panicle 1-4 cm. long and broad, very loose with capillary branches; spikelets 2-flowered, 1.5-2 mm. long, oblong-ovate, soon widely gaping, \pm purplish-brown and shining; glumes subequal, 1-1.5 mm. long, slightly shorter than flowers, ovate, green and purplish; lemma 1.5-2 mm. long, awnless, 5-nerved, truncate and irregularly denticulate at apex; palea subequal; upper floret shortly stalked; anthers minute, \pm 0.2 mm. long, dark.

106. **HOLCUS* L. (1753)

Tufted perennial, softly hairy all over; glumes *obtus*e, usually mucronate or tipped with a small awn to 1 mm. long; awn of upper lemma recurved, *hook-like*, to 2 mm. long, usually *hidden* by the glumes:

255. **H. lanatus* L. *Spec. Plant.* 2: 1048 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 10 fig. H-K (1952); Black, *Flor. S. Aust.* ed. 2: fig. 130 (1943); Morris in Ewart, *Flor. Vict.* fig. 106 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 114 (1940); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 58 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 236 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 413 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 367 (1923), as "*Notholcus lanatus*"; Herter, *Flor. il. Uruguay 1*: fig. 358 (1941); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3122, *col.* (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1200 (1931); Coste, *Flor. Franc.* 3: fig. 4081 (1906); Pfenniger in Hegi, *Ill. Flor. Mittel-Eur. 1*: t. 28 fig. 4, *col.* (1907); Reichenbach, *Icon. Flor. germ. 1*: fig. 1718-19 (1834).

Vern.: Yorkshire Fog. *Distr.*: Indigenous throughout Europe, temperate Asia and N.W. Africa; introduced into S. Afr., N. & S. Amer., N.Z., all Australian States, and abundant over the cooler parts of Victoria, tolerating moist shaded situations in mountain-forests (noted in such widely dispersed localities as Melbourne, sources of Yarra R., Brisbane Range, Otways, Mt. Macedon, Creswick, Colac, Hamilton, Poolaigelo, Graytown, Beechworth, Benambra, Cobungra, Suggan Buggan, Upper Delegate R., Phillip Id, Lake Mtn.).

—Creeping rhizomic perennial with grey-green, \pm pubescent leaves; glumes *acute to acuminate* but not awned; awn of upper lemma *slightly geniculate*, 3-5 mm. long, *protruding conspicuously* beyond the glumes:

256. **H. mollis* L. *Syst. Nat.* ed. 10, 2: 1305 (1759).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 238 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 414 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 368 (1923), as "*Notholcus mollis*"; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3121, *col.* (1934); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1201 (1931); Coste, *Flor. Franc.* 3: fig. 4082 (1906); Reichenbach, *Icon. Flor. germ. 1*: fig. 1721 (1834).

Vern.: Creeping Fog (Creeping Soft-grass). *Distr.*: Indigenous through much of Europe, but scattered; introduced into N. Amer., N.Z., and Victoria where known for certain only from the Leongatha district, S. Gippsland. In sandy fields it can become a troublesome weed, extremely difficult to eradicate.

[In Ewart's *Flor. Vict.* 190 (1931) Morris states that the grass is "widely spread in Victoria"; but the only specimen available in Melbourne Herbarium is from Kardella near Leongatha (Feb. 1924), and the present writer has failed to find it anywhere in this State.)

—Annual to 1 ft. high; glumes *acute*, terminating in *distinct awns* 1-3 mm. long; awn of upper lemma bent or recurved, about 2 mm. long, *protruding shortly* beyond glumes:

257. **H. setosus* Trin. in *Mém. Acad. St. Petersb. sér. 6 Sci. math. phys. & nat.* 5²: Bot. 87 (1840).

Illustr.: Roshevitz in Komarov, *Flor. U.R.S.S.* 2: t. 18 fig. 1 (1934).

Vern.: Annual Fog. *Distr.*: Indigenous to Spain and N. Africa; introduced into Asia Minor, Caucasus, and Victoria where at present known only from a few northern districts, viz. Sedgwick near Bendigo (Dec. 1956), Pyalong (Nov. 1960), near Euroa (1958) and Killawarra near Warby Range (Nov. 1960).

[The closely related South African *H. setiger* Nees (1832) was recorded from Harvey district, W.A., by C. A. Gardner in *Flor. W. Aust.* 1¹ (Gramineæ): 41 (1952); it seems to differ, if at all, from *H. setosus* only in the slightly shorter glumes with comparatively longer awns (3-6 mm.). In the event of these grasses proving inseparable specifically, then the older name *H. setiger* must stand.]

107. *HIEROCHLOË* R. Br. (1810)

Culms robust but soft; leaf-blades 5-8 mm. wide; spikelets 5-8 mm. long, rather crowded on panicle branches; glumes shiny, hyaline, almost as long as sterile lemmas (alpine):

258. *H. redolens* (Soland. ex Vahl) Roem. & Schult. *Syst. Veg.* 2: 514 (1817)
Holcus redolens Soland. ex Vahl *Symb. Bot.* 2: 102 (1791).

Illustr.: Burton in Maiden, *Agric. Gaz. N.S.W.* 15: t. opp. 244 (1904); Allan, *Bull. Dep. sci. industr. Res., N.Z.* 49: fig. 84 n. 1 (1936); Buchanan, *Indig. Grasses N.Z.* t. 6 (1877); Labillardière, *Nov. Holl. Plant. Specim.* 2: t. 232 (1806), as "*Disarrhenum antarcticum*".

Vern.: Sweet Holy Grass. *Distr.*: Scattered through alpine and subalpine tracts of eastern Victoria, usually in damp situations against springs or in swamps, and uncommon (Lake Mtn., Baw Baws, Mt. Buller, Mt. Buffalo, Bogong region, Limestone Ck at source of Murray R., Bidwell on Upper Delegate R.); also N.S.W., Tas., N.Z., ? N.G. (Mt. Wilhelm), and Antarctic S. America.

[The var. *submutica* (F. Muell., *ut sp.*) F. Muell. ex Benth. *Flor. aust.* 7: 558 (1878) differs in its smaller, more obtuse glumes and sterile lemmas which are not awned or only minutely so. It is known from the Cobboras and Bogong High Plains (including Mt. Feathertop) and may be genetically isolated.]

Culms narrow, becoming tough cane-like and branched (2-3 ft. high); leaf-blades 2-4 mm. wide; spikelets 4-5 mm. long, scattered, long-stalked in a short but very open panicle; glumes rather opaque, much shorter than sterile lemmas (rocky hills of far east):

259. *H. rariflora* Hook. f. *Flor. antarct.* 1: 93 (1845).

Illustr.: Morris in Ewart, *Flor. Vict.* fig. 54 (1931); Wills in Maiden, *Manual Grasses N.S.W.* t. opp. 103 (1898), also in *Agric. Gaz. N.S.W.* 5: t. opp. 359 (1894); Fitch in Hooker f., *Flor. Tasm.* 2: t. 157 A, col. (1859).

Vern.: Cane Holy Grass (Scented Holy Grass). *Distr.*: In Victoria restricted to East Gippsland where not uncommon on forested rocky slopes (Murrindal near Buchan, Mt. Kaye, Mt. Ellery, Bonang, Genoa R., Genoa Ck, Genoa Peak, Wingan Inlet, Howe Range); also N.S.W., Tas.

108. *ANTHOXANTHUM L. (1753)

260. *A. odoratum L. *Spec. Plant.* 1: 28 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 6 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 99 (1943); Morris in Ewart, *Flor. Vict.* fig. 56 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 124 (1940); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 244 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 796 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 261 (1923); Herter, *Flor. il. Uruguay* 1: fig. 439 (1942); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1167 (1931); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3001, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3917 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 24 fig. 4, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1722-24 (1834).

Vern.: Sweet Vernal-grass. *Distr.*: Indigenous almost throughout Europe and temperate Asia; introduced into S. Afr., N. & S. Amer., N.Z., all Australian States, and frequent in various open habitats from sea level to the alps in cooler districts of Victoria (e.g. Melbourne, Dandenongs, Frankston, Torquay, Otways, Creswick, Lake Mtn., Mt. Buffalo, Doughboy Id).

Diagn.: Tufted perennial with fragrant, \pm coumarin-like aroma (especially if crushed); culms erect, slender, unbranched, to 2 ft. high (rarely to 3 ft.); leaf-blades to 6" long (but sometimes <1"), 1.5-5 mm. wide, flat, finely acuminate, glabrous or loosely hairy (especially at sheath); ligule 1-5 mm. long, blunt, membranous; panicle narrow and spike-like, from very dense to \pm loose, to 5" long (but often much less), 6-15 mm. wide, ovoid to narrow-oblong, greenish-brown or purplish; spikelets 6-10 mm. long, lanceolate, on hairy pedicels to 1 mm. long, each with 3 florets that fall together (2 lower barren, the 3rd bisexual); glumes persistent, keeled, finely pointed, membranous, glabrous or sparsely hairy, the lower ovate, 1-nerved and 3-5 mm. long, the upper lanceolate, 3-nerved and 6-10 mm. long; barren lemmas 3-3.5 mm. long, narrow-oblong and bluntly bilobed at apex, firm, brown and villose (except for white membranous tip), 4- to 5-nerved, the lower with straight awn (2-4 mm. long) arising just above middle, the upper with stouter bent awn (6-9 mm. long) arising from near base; fertile lemma 2 mm. long, ovoid, glabrous, shining-brown; palea equal; anthers 3-4.5 mm. long.

Tribe PHALARIDÆ

109. *PHALARIS L. (1753)

1. Spikelets of two kinds, falling in groups of 5-7—a single fertile spikelet surrounded by 4-6 chaffy, pedicellate, variously shaped and sometimes deformed sterile spikelets (annual 1-2 ft., the dense shortly cylindrical spikes to 1" wide):

261. *P. paradoxa L. *Spec. Plant.* ed. 2, 2: 1665 (1763).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 4 fig. G & O, t. 5 fig. G (1952); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 797 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 252 (1923); Herter, *Flor. il. Uruguay* 1: fig. 446 (1942); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2994, col. (1930-1931); Coste, *Flor. Franc.* 3: fig. 3924 (1906); Reichenbach, *Icon. Flor. germ.* 1: fig. 1491 (1834).

Vern.: Paradoxical Canary-grass (Variable Canary-grass, Bristle-spiked Canary-grass). *Distr.*: Indigenous to the Mediterranean region; introduced into S. Afr., N. & S. Amer., all Australian States except Tas., and in Victoria occasional in northern irrigation districts (Far North-west, Barber's Lake near Dimboola, Sea Lake, Dookie, etc.), providing fair fodder.

—Spikelets all alike, not in groups and falling separately 2

2. Glumes wingless or almost so; sterile lemmas narrow, hairy, \pm equal (rhizomic perennial with stout reed-like culms 2-4 ft. high; panicle 4-8" long, narrow and spike-like or variously lobed and interrupted):

262. **P. arundinacea* L. *Spec. Plant.* 1: 55 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 4 fig. F & Q, t. 5 fig. F (1952); Allan, *Bull. Dep. sci. industr. Res.*, N.Z. 83: fig. 123 a & f (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 59 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 248 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 79 (1957); Wallis in Dayton, *Yearb. Agric. U.S. Dep. Agric.* 683 (1948); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 254 (1923); Herter, *Flor. il. Uruguay* 1: fig. 440 (1942); Coste, *Flor. Franc.* 3: fig. 3919 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 24 fig. 2, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1494 (1834).

Vern.: Reed Canary-grass. *Distr.*: Indigenous throughout Europe, temperate Asia, N. America and parts of S. Africa, usually in marshes or beside water; introduced into S. Amer., N.Z., N.S.W., Qd, W.A. and Victoria where of scattered and infrequent occurrence (Linton, Flinders, Graytown).

—Glumes with broad pale wings; sterile lemmas unequal; panicle spike-like, oblong to cylindrical 3

3. Annual; panicle oblong to shortly cylindrical, rarely >2" long; glumes acuminate; only one sterile lemma developed:

263. **P. minor* Retz. *Obsns bot.* 3: 8 (1784).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 4 fig. B & L, t. 5 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 98 (1943); Morris in Ewart, *Flor. Vict.* fig. 55 (1931); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 119 (1923); Allan, *Bull. Dep. sci. industr. Res.*, N.Z. 83: fig. 123 d & m (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.*: fig. 61 (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 800 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 255 (1923); Herter, *Flor. il. Uruguay* 1: fig. 443 (1942); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2995, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3923 (1906).

Vern.: Lesser Canary-grass. *Distr.*: Indigenous to the Mediterranean region; introduced into Britain, Pakistan, S. Afr., N. & S. Amer., N.Z., all Australian States, and frequent as a crop or wayside weed throughout western and north-eastern Victoria (Far North-west, Little Desert, Upper Glenelg R., Murtoa, Colac, Creswick, Torquay, St. Leonards, Frankston, Melbourne, Graytown, Nathalia, Cornishtown etc.) but apparently uncommon in Gippsland.

—Shortly rhizomic perennial, with culms slightly swollen at base, often rooting from lower nodes; panicle long-cylindric, 3-6" long; glumes broadly acute; sterile lemmas both present, the larger $\pm \frac{1}{2}$ the length of fertile lemma:

264. **P. tuberosa* L. *Mant. Plant.* 2: 557 (1771)

var. *stenoptera* (Hack.) Hitchc. in *J. Wash. Acad. Sci.* 24: 292 (1934).

P. stenoptera Hack. in *Repert. nov. Spec. Regn. veg.* 5: 333 (1908).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 4 fig. h & m, t. 5 fig. c (1952); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 120 (1923), as "*P. bulbosa*"; Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 123 b & h (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 60 (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 806 (1951); Herter, *Flor. il. Uruguay* 1: fig. 442 (1942).

Vern.: Toowoomba Canary-grass. *Distr.*: Origin unknown, but it appeared in Toowoomba Botanic Garden (Qd) about 1902, and was distributed thence to other parts of Australia—also overseas—as a valuable fodder grass under the name "*P. commutata*"; now cultivated and more or less naturalized in S. Afr., N. & S. Amer., N.Z., all Australian States except Tas. (?), and noted in north-eastern & western Victoria—at Tongala, Dookie, Rutherglen, Cornishtown, Tylden near Woodend, Camperdown, Timboon, Werribee where cultivated.

[Toowoomba Canary-grass has been called "Harding Grass" and "Peruvian Winter-grass" in the western United States. In *Grasses & Pastures S. Afr.* 90 (1955) Chippindall states that it is a hybrid population between *P. tuberosa* and *P. arundinacea*. Typical *P. tuberosa* from the Mediterranean region differs in its longer, more branched rhizomes and the culm-bases *distinctly swollen* into hard woody stocks.

The Western Mediterranean and Canary Islands *P. canariensis* L. (Canary-grass) is described as "common in Victoria" by Morris in Ewart's *Flor. Vict.* 136 (1931); but the present writer has failed to find it anywhere in the State, and the only voucher specimen in Melbourne Herbarium is one collected recently at Rockbank (Sept. 1959), where it may have been a transitory occurrence. This small annual species is recognizable by its short, *ovoid* inflorescence and *large obovate* spikelet (7-10 mm. long); the sterile lemmas are subequal and about half as long as the fertile lemma. *P. canariensis* is recorded as naturalized in all other States except Tasmania, and its apparent absence from (or present great rarity in) Victoria is remarkable.]

Tribe MILIÆ

[The widespread boreal **Milium effusum* L. (Wood or English Millet) is a tall tufted perennial (2-5 ft.) with broad flat leaves and large open panicles, having the small, 1-flowered, awnless spikelets scattered along verticillate branches. It is described by Morris in Ewart's *Flor. Vict.* 168 (1931) as naturalized in north-eastern Victoria. Presumably the basis of this statement is a single collection bearing the label "Goulburn, 1902" (from C. Walter's herbarium), the origin of which is dubious; neither the present writer nor any other recent collector has seen *M. effusum* growing in Victoria, and records from other States are also lacking.]

Tribe AGROSTIDÆ

110. **AMMOPHILA* Host (1809)265. **A. arenaria* (L.) Link *Hort. bot. Berol.* 1: 105 (1827).

Arundo arenaria L. *Spec. Plant.* 1: 82 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 67 fig. d (1952); Black, *Flor. S. Aust.* ed. 2: fig. 122 (1943); Morris in Ewart, *Flor. Vict.* fig. 98 (1931); Laurence

in Chippindall, *Grasses & Pastures S. Afr.* fig. 65 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 262 (1954); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 365 (1923); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1187 (1931), as "*Psamma arenaria*"; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg. 11*: fig. 3065, col. (1930-31), as "*Psamma arenaria*"; Coste, *Flor. Franc. 3*: fig. 3988 (1906); Hegi, *Ill. Flor. Mittel-Eur. 1*: t. 27 fig. 5 (1907), as "*A. arundinacea*"; Reichenbach, *Icon. Flor. germ. 1*: fig. 1454 (1834).

Vern.: Marram Grass (Sea Mat-grass, European Beach-grass—U.S.A.). *Distr.*: Indigenous to sand-dunes along the coasts of W. Europe; introduced into S. Afr., N. Amer., N.Z., all Australian States except Qd (?), and a frequent effective sand-binder of the Victorian coast-line (Gabo Id, Lakes Entrance, Wilson Prom., Phillip Id, Mornington Penins., Port Phillip Bay, Torquay, Anglesea, Warrnambool).

Diagn.: Stout rhizomic perennial, forming compact tufts 2-4 ft. high; rhizomes tough, long-creeping through loose sand; leaf-blades tough, flaccid, to 2 ft. long and to 6 mm. wide, greyish-green, with overlapping sheaths and sharp-pointed apices, tightly inrolled, but when opened out displaying close and densely pubescent ribs on the upper-surface, glabrous on under-surface; ligule narrow, firm, \pm bifid, 1-3 cm. long; culms stout, rigid, glabrous; panicle dense, spike-like lanceolate-oblong, cylindrical, pale, 3-10" long and up to 1" thick, the branches erect; spikelets on pedicels 1-4 mm. long, each narrowly oblong, closely overlapping, 10-16 mm. long, 1-flowered; glumes \pm equal, persistent, firm, lanceolate, \pm 12 mm. long (rarely more), the lower 1-nerved, upper 3-nerved; lemma 8-12 mm. long, lanceolate, but blunt and \pm 3-toothed at summit, firm, keeled, 5- to 7-nerved, white-hairy at base; palea equal, 2- to 4-nerved; anthers 4-7 mm. long.

111. DICHELACHNE Endl. (1833)

Panicle *dense*, with *many* (>100) *overlapping* spikelets; glumes *equal*, with tapering, \pm awn-like apices; lemma usually *shorter* than glumes; awn 1-5-5-5 cm. long, arising well below tip of lemma, uniformly filamentous throughout, neither thickened and twisted in lower half *nor* noticeably bent at centre, often slightly flexuose:

266. *D. crinita* (L. f.) Hook. f. *Flor. N.-Z. 1*: 293 (1853).

Anthoxanthum crinitum L. f. *Suppl. Plant.* 90 (1781).

Illust.: Gardner, *Flor. W. Aust. 1*¹ (Gramineæ): t. 46 fig. A (1952); Black, *Flor. S. Aust. ed. 2*: fig. 121 (1943); Morris in Ewart, *Flor. Vict.* fig. 89 (1931); Grosse in Turner, *Aust. Grasses* t. opp. 21 (1895); Bailey, *Ill. Monogr. Grasses Qd 1*: t. [14] (1878); Bacchus, *Annu. Rep. Dep. Agric. Vict. 2*: t. 17 (1874); Buchanan, *Indig. Grasses N.Z.* t. 15 (1877).

Vern.: Long-hair Plume-grass. *Distr.*: Almost throughout Victoria (except in damp shaded forests), frequent on the coast and in drier open forest country, but less common in the alps and rare in Mallee areas (noted in such widely dispersed localities as Port Phillip Bay, Otways, Warrnambool, Lower Glenelg R., Dimboola, Black Range, Creswick, Nathalia, Mt. Buller, Omeo, Cobboras, Suggan Buggan, Orbost, Gabo Id, Wilson Prom.); all Australian States, N.Z.

Panicle *loose*, the spikelets *separated* and often as few as 30; glumes *unequal* (the lower slightly shorter than upper), acute but not awn-like at apices; lemma *as long as or longer than* glumes; awn 1-2 cm. long, arising almost at tip of lemma, *thickened and much twisted* in lower half, then bent \pm abruptly:

267. *D. sciurea* (R. Br.) Hook. f. *Flor. N.-Z.* 1: 294 (1853).

Agrostis sciurea R. Br. *Prodr. Flor. Nov. Holl.* 171 (1810).

Illust.: Grosse in Turner, *Aust. Grasses* t. opp. 22 (1895); Fitch in Hooker f., *Flor. Tasm.* 2: t. 158 A, col. (1859); Buchanan, *Indig. Grasses N.Z.* t. 16 (1877).

Vern.: Short-hair Plume-grass. *Distr.*: In Victoria almost co-extensive with *D. crinita* (L.c.), but more frequent in E. Gippsland and extending into the Far North-west; temperate parts of all Australian States, also N.Z.

112. *DEYEUXIA* Clar. ex Pal. Beauv. (1812)

[Key adapted from that by J. W. Vickery (for all Australian species) in *Contr. N.S.W. Herb.* 1*: 75-81 (1940).]

1. Lemma *much longer* than the widely gaping, minute (± 1 mm. long), obtusish glumes; panicle open, \pm pyramidal, 1-3" long; whole spikelet < 2 mm. long, with very short rigid awn (± 0.5 mm.) arising just below apex of lemma (rare, very slender subalpine grass of the far east):

268. *D. gunniana* (Nees) Benth. *Flor. aust.* 7: 584 (1878).

Echinopogon gunnianus Nees in Hook. *Lond. J. Bot.* 2: 413 (1843).

Illust.: Chambers in Maiden, *Agric. Gaz. N.S.W.* 13: t. opp. 593 (1902), as "*D. breviglumis*".

Vern.: Bent-grass. *Distr.*: In Victoria known only from wet ground around sphagnum bogs at Bidwell (3000 ft. alt.) on the Upper Delegate R., far E. Gippsland; also Tas., N.S.W., S.E. Qd—always in cool, moist, montane localities.

—Lemma *shorter* than or \pm equal to the upper glume; glumes rarely wide-gaping 2

2. Awn *not or only slightly exceeding* the lemma, sometimes minute and inconspicuous (often early deciduous) 9

Awn conspicuous, much exceeding the lemma 3

3. Awn arising in *upper third* of lemma, 4-6 mm. long, stiff, \pm recurved and prominently exerted; panicle \pm contracted and spike-like, 3-6" long, often purplish; lemma acuminate, 5-6 mm. long, \pm equalling the glumes (alpine or subalpine):

269. *D. brachyathera* (Stapf) J. W. Vickery in *Contr. N.S.W. Herb.* 1: 68 (1940).

Dichelachne brachyathera Stapf in *Kew Bull.* 1906: 203 (1906).

Illust.: Maiden, *Agric. Gaz. N.S.W.* 22: t. opp. 816 (1911), as "*Dichelachne brachyathera*".

Vern.: Bent-grass. *Distr.*: Occasional in damp alpine grassland and alpine herb-field of eastern Victoria above 4000 ft., sometimes entering subalpine woodland (Cobboras, Nunniong Plateau, Dargo High Plains, Mts. Bogong, Feather-top, Buffalo, Cobbler & Buller, Baw Baws), but the origin of a specimen labelled "Grampians"—ex Herb. C. Walter, 1887—is dubious; also alps and subalps of Tas., N.S.W.

—Awn attached in *middle third* of lemma 5

Awn attached in *lower third* or near base of lemma; panicle *much contracted*, dense and spike-like 4

4. Leaf-blade flat or slightly inrolled, never subulate, 4-12" long, >2 mm. wide; ligule 2-5 mm. long; lower glume slightly longer than upper (variable grass, widespread except on plains and in Mallee):

270. *D. quadriseta* (Labill.) Benth. *Flor. aust.* 7: 581 (1878).

Avena quadriseta Labill. *Nov. Holl. Plant. Specim.* 1: 25, t. 32 (1805);

Calamagrostis quadriseta (Labill.) Spreng. *Syst. Veg.* 1: 253 (1825).

Illust.: Labillardière (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 47 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 119 (1943); Morris in Ewart, *Flor. Vict.* fig. 88 (1931), as "*Calamagrostis quadriseta*"; Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. opp. 563 (1891); Buchanan, *Indig. Grasses N.Z.* t. 26 (1879), as "*Agrostis quadriseta*".

Vern.: Reed Bent-grass. *Distr.*: Frequent almost throughout Victoria in woodland, heath and grassland formations on a wide range of soils, but absent from the Mallee and higher alps and uncommon in (or lacking from) many areas of E. Gippsland; temperate parts of all Australian States, also N.Z.

—Leaf-blade strongly involute, subulate, often rigid, 2-4" long, <2 mm. wide; ligule <2 mm. long; lower glume slightly shorter than upper (alpine or subalpine):

271. *D. monticola* (Roem. & Schult.) J. W. Vickery in *Contr. N.S.W. Herb.* 1: 56 (1940).

Agrostis monticola Roem. & Schult. *Syst. Veg.* 2: 359 (1817);

A. montana R. Br. *Prodr. Flor. Nov. Holl.* 171 (1810), non Krock. (1787).

Illust.: Chambers in Maiden, *Agric. Gaz. N.S.W.* 12: t. opp. 1199 (1901), as "*D. montana*"; Fitch in Hooker f., *Flor. Tasm.* 2: t. 160 A, col. (1859), as "*Agrostis montana*".

Vern.: Bent-grass. *Distr.*: Widespread and rather frequent in open montane woodland and subalpine grassland of eastern Victoria (Genoa Falls, Bendoc, Bidwell, Goonmirk Range, Cobboras, Dargo & Bogong High Plains, Barry Mtns., Mt. Buffalo, Mt. Buller, Baw Baws, Lake Mtn. area), with an isolated western occurrence on Mt. Macedon; Tas., N.S.W.

5. Longer glume <4 mm. in length or, if ever 4 mm., then lemma much shorter than glumes 8

Longer glume 4-6 mm. in length; lemma almost equalling the glumes 6

6. Panicle open, loosely spreading; upper glume manifestly longer than lower; awn 2-3 mm. long; anthers \pm 2 mm. long (mountain-forest to alpine grass):

272. *D. frigida* F. Muell. ex Benth. *Flor. aust.* 7: 583 (1878).

Calamagrostis frigida (F. Muell. ex Benth.) Maiden & Betche *Census N.S.W. Plants* 21 (1916).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Occasional in montane forest, alpine woodland and grassland of eastern Victoria (Cobboras, Wulgulmerang, Rocky Valley in Bogongs, Barry Mtns., Mt. Speculation, Mt. Buller, Blacks' Spur near Healesville, Wallaby Ck near Kinglake); ? N.S.W. (presumptive but still uncertain occurrence).

—Panicle *dense*, \pm cylindrical and *spike-like*, 6-12 cm. long; glumes sub-equal; awn 4-5 mm. long; anthers <1.5 mm. long 7

7. Leaves \pm thin, *acuminate*; awn *long-exserted*, exceeding lemma by the *length of lemma* (or more); rhachilla produced into a *plumose* bristle 1-2 mm. long (lowland or montane grass):

273. *D. densa* Benth. *Flor. aust.* 7: 582 (1878).

Calamagrostis densa (Benth.) Maiden & Betche *Census N.S.W. Plants* 21 (1916).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Occasional on coastal heathland and in near-coastal woodland throughout Southern Victoria (Maramingo Ck in far E. Gippsland, Cape Conran, near Mt. Wellington, Wilson Prom., Foster, Bunyip R., Clayton, near Melbourne, Mt. Clay near Portland, Lower Glenelg R., Mts. William & Rosea in Grampians); Tas., ? N.S.W. (dubious record), S.A. (Mt. Lofty Range).

—Leaves \pm thick, rigid, *obtusish and keeled* at apex; awn *slightly exserted*, exceeding lemma by *less than length of lemma*; rhachilla produced into a minute *glabrous* bristle, ± 0.5 mm. long (rare alpine grass):

274. *D. carinata* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 58 (1940).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Very localized and uncommon in Victoria, where known by only a few collections from the alps (Cobboras, Mt. Hotham, Bogong High Plains, Mt. Buffalo—all above 4500 ft.); also N.S.W. (Kosciusko region).

8. Culms *erect*, \pm rigid; panicle very short and *dense*, <4 cm. long (usually 1-2 cm.); glumes straight, *not* bulging around the *much shorter* lemma; awn exserted, exceeding lemma by *about the length of lemma* (chiefly a near-coastal grass):

275. *D. minor* F. Muell. ex Benth. *Flor. aust.* 7: 582 (1878).

Calamagrostis minor (F. Muell. ex Benth.) J. M. Black in *Trans. roy. Soc. S. Aust.* 43: 27 (1919).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Scattered through southern coastal districts of Victoria, on sandy soils and uncommon (Lower Cann R. & Reedy Ck flats in E. Gippsland, Corner Inlet, Warrandyte, Nareen, Lower Glenelg R.), with an outlying occurrence in Grampians; Tas., S.A. (Mt. Lofty Range and Kangaroo Id).

—Culms weak, *ascending*; panicle 5-15 cm. long, \pm contracted but *loose*; glumes broad, *bulging* around the *subequal* lemma and *gaping* widely at maturity; awn exceeding lemma by *much less than length of lemma* (mountain-forest grass):

276. *D. rodwayi* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 60 (1940).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Scattered but sometimes locally frequent in mountain-forests of eastern Victoria, tolerating more shade than most members of *Deyeuxia* (Dandenongs, Barry Mtns., Bogong township, Mt. Ellery, Goonmirk & Howe Ranges); Tas., N.S.W. (Kosciusko region).

9. Awn attached *just below* apex of lemma (or at least in the upper third) 11
 Awn attached in *middle third* of lemma, which almost equals length of glumes 10
10. Panicle to 4" long, rigidly erect, *dense and spike-like*, on stout culm to 1 ft. high; spikelets 3-4 mm. long, \pm turgid, the glumes not gaping; awn straight (glabrous, high-alpine grass, with rigidly erect, rather thick leaf-blades 3-6 mm. wide):

277. *D. crassiuscula* J. W. Vickery in *Contr. N.S.W. Herb. 1*: 59 (1940).
D. nivalis (F. Muell., ut *Agrostis*, 1855) Benth. *Flor. aust. 7*: 583 (1878), non Wedd. (1875);
Calamagrostis nivalis (F. Muell.) Maiden & Betche *Census N.S.W. Plants 21* (1916).

Illust.: Chambers in Maiden, *Agric. Gaz. N.S.W. 13*: t. opp. 375 (1902), as "*D. nivalis*".

Vern.: Bent-grass. *Distr.*: In Victoria restricted to a few sheltered situations, usually among rocks in grassland or alpine woodland, above 5000 ft. (Cobboras, Middle Ck near Mt. Cope, Mts. Bogong, Fainter, Hotham & Buller); also N.S.W. (Kosciusko region).

—Panicle to 8" long, \pm contracted but quite *loose*, on rather stout *erect* culms 1'-2' 6" high; spikelets 4-5 mm. long; glumes *not gaping*; awn *straight* (mountain-forest grass):

278. *D. benthamiana* J. W. Vickery in *Contr. N.S.W. Herb. 1*: 63 (1940).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Rare in Victoria where known only by a few collections from mountain-forest of the eastern highlands (Mt. Buffalo, Tyers R., Wilson Prom., Murrungowar Mtns, in E. Gippsland—apparently all on rocky granitic terrain), but precise distribution uncertain owing to confusion with the closely related *D. frigida* which has larger spikelets and much more conspicuous awns; also Tas. (Mt. Wellington region).

—As for the last, but culms weak and *ascending*, spikelets 3-4 mm. long, glumes *widely gaping* and awn *curved*:

D. rodwayi J. W. Vickery [See No. 276].

11. Leaves and culms *rigidly erect*, the former very long (to 1 ft.) or 3-6 mm. broad; panicles narrow, compact and *spike-like* 14
 Leaves and culms \pm lax; panicles open and spreading or contracted but *not compact* (chiefly mountain-forest grasses) 12
12. Spikelet 3.5-4.5 mm. long; glumes *hardly gaping*; rachilla produced into a long-plumose bristle; anthers \pm 1 mm. long:

279. *D. microseta* J. W. Vickery in *Contr. N.S.W. Herb. 1*: 66 (1940).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Very localized and apparently rare in Victoria where known only from Combienbär in E. Gippsland; otherwise restricted to the Blue Mtns. in N.S.W.—in montane eucalypt forest to 3000 ft.

—Spikelet <3·5 mm. long

13. Spikelet green, 3·3-5 mm. long; glumes *widely gaping* at maturity; lemma *very scaberulous*, with conspicuous *hairy* rhachilla-bristle and *very short* tuft of hairs on callus; anthers \pm 1·5 mm. long:

280. *D. scaberula* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 64 (1940).

Illust.: (?) Rodway, *Tasm. Flor.* t. opp. 265 (1903), as "*D. scabra*".

Vern.: Bent-grass. *Distr.*: Localized and uncommon in Victoria where restricted to eastern mountain-forests, usually in rocky places (Mt. St. Bernard, 12 miles N. from Murrungowar and on Mt. Ellery in E. Gippsland); Tas., N.S.W. (Blue Mtns.).

—Spikelet green or purplish, 2·5-3 mm. long; glumes slightly gaping; callus *very shortly* hairy; rhachilla-bristle minute, *glabrous*; anthers <0·5 mm. long:

281. *D. contracta* (F. Muell. ex Hook. f.) J. W. Vickery in *Contr. N.S.W. Herb.* 1: 65 (1940).

Agrostis contracta F. Muell. ex Hook. f. *Flor. Tasm.* 2: 116 (1858), t. 161 A, col. (1859).

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Bent-grass. *Distr.*: Restricted in Victoria to eastern mountain-forests and rare (Dandenongs, Buffalo Range, near Mt. Feathertop at 2600 ft., Bairnsdale district); Tas. (Huon R.), N.S.W. (Barber's Ck).

—Spikelet often *dark purplish*, 2·2-5 mm. long; glumes obtusish, ultimately gaping; rhachilla-bristle *plumose* with hairs *almost as long as lemma*; callus *long-hairy*; anthers \pm 0·8 mm. long; awn microscopic, < 0·5 mm. long (alpine grass):

282. *D. parviseta* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 71 (1940).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Known in Victoria only by a single collection from *Eucalyptus pauciflora* woodland on Mt. Buller, at \pm 4500 ft. (Mar. 1953); otherwise scattered through rain forests of N.S.W.

14. Culm slender but rigid, \pm *wiry*, 2-4 ft. high; leaf-blades 1 ft. long or more, *involute*, with long-subulate apices; panicle 3-6" long; ligule *very prominent*, 5-10 mm. long, acute but soon torn; lemma \pm linear, 4 mm. long; awn very slender, minute, <1 mm. long, *not* reaching tip of lemma; anthers \pm 2 mm. long (rare grass of dryish forest):

283. *D. sp.*—aff. *D. angustifolia* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 67 (1940).

Illust.: Nil.

Vern.: Bent-grass. *Distr.*: Apparently endemic in dryish *Eucalyptus albens* forest, amongst rocks on Ballantyne Hills near Suggan Buggan, far E. Victoria, but possibly ranging eastward through similar country into N.S.W.

[Although close in habit and inflorescence to *D. angustifolia*—type from Blue Mtns., N.S.W.—the Victorian grass differs in its much *longer ligule*, distinctly *hairy callus* of lemma, and very inconspicuous *thin awn*. It may constitute an undescribed species.]

—Culm stout, rarely > 1 ft. high; leaf-blades < 6" long, flat, 3-6 mm. wide; panicle 2-3" long; ligule < 5 mm. long, truncate; lemma lanceolate to fusiform, \pm 3 mm. long; awn 1-2 mm. long, *shortly exceeding* lemma; anthers \pm 1 mm. long (alpine grass):

D. crassiuscula J. W. Vickery [See No. 277].

113. AGROSTIS L. (1753)

1. Lemma distinctly *awned* from the middle (or lower down) 8
 Lemma *awnless* (very rarely with a minute awn from near tip) 2
2. Panicle *exceedingly lax, open and diffuse*, with widely separated spikelets on capillary stalks; palea \pm *equal* in length to lemma (weak shade-loving grass; glumes hyaline and shining except for the green scabrid keels):

284. *A. rudis* Roem. & Schult. *Syst. Veg.* 2: 360 (1817).

A. scabra R. Br. *Prodr. Flor. Nov. Holl.* 172 (1810), *non* Willd. (1797);

Calamagrostis rudis (Roem. & Schult.) Steud. *Synops. Plant. Glumac.* 1: 192 (1854).

Illust.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 160 B, col. (1859), as "*A. scabra*"; Fitch in Hooker f., l.c. t. 159 B, col. (1859), as "*A. æquata*"; Buchanan, *Indig. Grasses N.Z.* t. 26^a (1879), as "*Deyeuxia scabra*".

Vern.: Bent. *Distr.*: Scattered and rare in Victoria (chiefly in the south-west) where known only from damp rather shaded situations at Main Ck near Arthur's Seat, Lake Corangamite, Goræ West near Portland, Lower Glenelg R. from Moleside Ck downstream to Nelson; also Tas., probably S.A. (in extreme south-east) and N.Z.

[*A. æquata* Nees in Hook. *Lond. J. Bot.* 2: 412 (1843) differs only in the smaller, less acute and less scabrid glumes—features merely of degree—and is here treated as a slight variant of *A. rudis*; the Lake Corangamite and Nelson collections were determined as *A. æquata* by Miss J. W. Vickery.]

—Panicle erect, *not* lax and diffuse or, if occasionally so, then the palea *absent* 3

3. Culms < 1 ft. high; leaf-blades mostly *inrolled or filiform*; panicle < 4" long (usually < 3"); palea *absent or minute* (chiefly *annual, alpine* tufted grasses, *without* rhizomes or stolons) 7
 Culms 1 ft. high or more (if ever < 1 ft., then palea *at least* half as long as lemma); leaf-blades *flat* (*perennials*, often spreading extensively by rhizomes or stolons) 4
4. Panicle *diffuse*, with long capillary branches; palea *absent* (rather weak mountain-forest grass, tufted or sometimes with a short rhizome; ligule 2-5 mm. long):

285. *A. hiemalis* (Walt.) Britton et al. *Prelim. Cat. N.Y. Plant.* 68 (1888).

Cornucopiæ hyemale Walt. *Flor. Carol.* 73 (1788);

A. scabra Willd. *Spec. Plant.* 1: 370 (1797), *non* R. Br. (1810).

Illust.: Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 488 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 343 (1923); Makino, *Ill. Flor. Jap.* 818 (1924), as "*A. scabra*".

Vern.: Bent. *Distr.*: Widespread and rather frequent in damp shaded situations in the highlands of eastern Victoria, from mountain-forest at low altitudes to alpine woodland and grassland above 5000 ft. (Dandenongs, Baw Baws, Upper Yarra & Upper Goulburn Ranges, Lake Mtn., Delatite R., Dargo High Plains, Mt. St. Bernard, Bogong township, Cobboras, Upper Delegate R., Orbost district); N.S.W., Tas., Japan, U.S.A., E. Canada.

[In *Manual Grasses U.S.* ed. 2: 349 (1951), Hitchcock recognizes *A. hiemalis* and *A. scabra* Willd. as distinct species—the former with smaller (<2 mm. long) more congested spikelets and minute anthers only 0.2 mm. long. If this view be generally adopted, then Australian populations would be referable to *A. scabra*.]

—Panicle often open, but hardly diffuse; palea *present*, from half to as long as lemma (widespread introduced grasses, with *long-creeping rhizomes or stolons*) 5

5. Glumes *falling with spikelet* as a whole; palea and lemma *subequal*; anthers \pm 0.5 mm. long (water-loving, stoloniferous grass with *dense, somewhat interrupted* panicle):

286. **A. semiverticillata* (Forsk.) C. Chr. in *Dansk bot. Ark.* 4: 12 (1922).

Phalaris semiverticillata Forsk. *Flor. ægypt.-arab.* 17 (1775).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 118 (1943); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 69 (1955); Koppel, *Flor. Israel* t. 105 (1956); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 280 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 56 (1957); Hitchcock, *Manual Grass. U.S.* ed. 2: fig. 463 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 331 (1923), as "*A. verticillata*"; Herter, *Flor. il. Uruguay* 1: fig. 383 (1941), as "*A. verticillata*"; Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3069 d, col. (1930–31), as "*A. verticillata*"; Coste, *Flor. Franc.* 3: fig. 4010 (1906), as "*A. verticillata*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1435 (1834), as "*A. verticillata*".

Vern.: Water Bent. *Distr.*: Indigenous to the Mediterranean region and N.E. Africa; introduced into Pakistan, S. Afr., N. & S. Amer., N.Z., N.S.W., S.A., W.A., and occasional near water in southern Victoria (e.g. Melbourne district, Anglesea).

—Glumes *persisting* on the pedicels; palea *shorter* than lemma; anthers 1.1–1.5 mm. long 6

6. Plant spreading by leafy *stolons*; panicle *contracted and closing* in fruit, oblong to linear, usually <3" long (leaf usually *bluish-green*, ligule 1–6 mm. long):

287. **A. stolonifera* L. *Spec. Plant.* 1: 62 (1753).

Illust.: J. Dep. Agric. S. Aust. 10: 743 (1907), as "*A. alba* var. *stolonifera*"; Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 278 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 464 (1951); Herter, *Flor. il. Uruguay* 1: fig. 382 (1941); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1182 (1931), as "*A. palustris*"; Burr & Turner, *Brit. econ. Grasses* 27 (1933); Reichenbach, *Icon. Flor. germ.* 1: fig. 1430 (1834).

Vern.: Creeping Bent (Fiorin). *Distr.*: Indigenous throughout Europe, temperate Asia and N. America; introduced into S. Amer., N.Z., Tas., N.S.W., Qd, and both extensively planted for lawns or golf-greens and naturalized in many parts of Victoria (e.g. Melbourne district, Frankston, Geelong, Daylesford, St. Arnaud).

[Several varieties of *A. stolonifera* are recognized, distinguished by size and degree of stolon development, e.g. var. *palustris* (Huds.) Farw.; this and others may be present in Victoria. *A. stolonifera* occasionally hybridizes with *Polypogon monspeliensis* to give \times *Agropogon littoralis* (Sm.) C. E. Hubbard, of which *Polypogon lutosus* (Poir.) Hitchc. is a synonym.]

—Plant spreading by *tough rhizomes* (sometimes also by stolons); panicle *remaining open* in fruit, often with an *olive-brownish* cast, usually >3" long (leaf *bright green*; ligule usually *shorter than broad*, 0.5-2 mm. long):

288. **A. tenuis* Sibth. *Flor. oxon.* 36 (1794).

A. vulgaris With. *Bot. Arr. Veg. Brit. Isles* ed. 3, 2: 132 (1796).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 274 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 468 (1951); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3069 c, col. (1930-31), as "*A. vulgaris*"; Coste, *Flor. Franc.* 3: fig. 4009 (1906), as "*A. vulgaris*"; Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 27 fig. 1 (1907), as "*A. vulgaris*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1427 (1834), as "*A. vulgaris*".

Vern.: Brown-top Bent. *Distr.*: Indigenous throughout Europe and temperate Asia; introduced into N. & S. Amer., ? S. Afr., N.Z., all the Australian States and in Victoria a frequent and often dominant grass of open country on heavier soils from the Wimmera to the eastern alps (e.g. Horsham, Daylesford, Creswick, Anglesea, Melbourne district, Dandenongs, Baw Baws, Bogong High Plains—where occasional).

—As for the last, but panicle often *purplish* (3-12" long), leaf *dull green*, ligule at least *as long* (1.5-6 mm.) *as broad* and keels of glumes rough *all the way* from apex to base (robust grass 1-4 ft. high):

289. **A. gigantea* Roth *Tent. Flor. Germ.* 1: 31 (1788).

A. alba auctt. plur., non L. (1753).

Illust.: Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: 264 (1940), as "*A. alba*"; Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 276 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 55 (1957), as "*A. alba*"; Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 467 (1951), as "*A. alba*"; Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3069, col. (1930-31); Coste *Flor. Franc.* 3: fig. 4011 (1906), as "*A. alba*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1433 (1834).

Vern.: Red-top Bent (Black Bent). *Distr.*: Indigenous to most parts of Europe and temperate Asia; introduced into N. Amer., N.Z., all Australian States, and frequent along drains etc. in many parts of Victoria (e.g. Melbourne district, Seymour, Numurkah, Hopetoun), but range imperfectly known owing to confusion with other *Agrostis* species.

7. Panicle *contracted*, with *erect* branches; anthers 0.6-0.8 mm. long (leaves slightly inrolled or almost flat, rarely quite filiform; ligule *acutish* 2-3 mm. long):

290. *A. muelleriana* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 103 (1941).

A. gelida F. Muell. in *Trans. Vict. Inst.* 43 (1855), non Trin. (1845);

A. muelleri Benth. *Flor. aust.* 7: 576 (1878), non K. B. Presl (1844).

Illust.: Chambers in Maiden, *Agric. Gaz. N.S.W. 10*: t. opp. 1164 (1899), as "*A. muelleri*"; Buchanan, *Indig. Grasses N.Z. t. 20 A* (1877), as "*A. canina var. gelida*".

Vern.: Bent. *Distr.*: Restricted in Victoria to alpine grassland and herbfield above 5000 ft., but locally rather frequent (Cobboras, Bogong High Plains, Mts. Buffalo & Buller); Tas. (apparently rare), N.S.W. (Kosciusko region).

—Panicle *widely spreading, long-exserted* beyond upper sheath, \pm rigid, the branches *short* and \pm *perpendicular* to axis; anthers 0.3-0.5 mm. long (leaves filiform-setaceous; ligule *obtuse*, 1-2 mm. long):

291. *A. parviflora* R. Br. *Prodr. Flor. Nov. Holl.* 170 (1810).

Illust.: Fitch in Hooker f., *Flor. Tasm. 2*: t. 158 B, *col.* (1859); Buchanan, *Indig. Grasses N.Z. t. 20 C* (1877).

Vern.: Bent. *Distr.*: Occasional in the eastern highlands of Victoria on alpine and subalpine grassland, sometimes penetrating sphagnum bog (Lake Mtn., Baw Baws, Mts. Buller & Buffalo, Bogong & Dargo High Plains, Bidwell on Upper Delegate R.); Tas. (widespread and frequent); N.S.W. (Kosciusko region)

—As for the last, but panicle *not* or only slightly exserted, *lax*, and with *long-capillary ascending* branches:

292. *A. australiensis* Mez in *Repert. Spec. nov. Regn. veg.* 17: 302 (1921).

Illust.: Chambers in Maiden, *Agric. Gaz. N.S.W. 10*: t. opp. 1166 (1899), as "*A. scabra*".

Vern.: Bent. *Distr.*: Localized and apparently rare in Victoria where known from only two alpine localities—both occurrences in sphagnum bog at or above 4500 ft. (Mt. Buffalo, Rocky Valley on Bogong High Plains), but possibly overlooked from its likeness to *A. parviflora*; also Tas. (Mt. Wellington), N.S.W. (Kosciusko region) and the A.C.T.

8. Lemma *villous-hairy* on back 10
 Lemma quite *glabrous*, or at most finely scaberulous 9

9. Leaf-blade filiform; ligule 2-3 mm. long; spikelets 2-4 mm. long (often purplish); rhachilla *not* produced; palea *minute or absent*; callus *glabrous*; anthers <0.4 mm. long:

293. *A. venusta* Trin. in *Mém. Acad. St. Pétersb. sér. 6 Sci. math. phys. & nat.* 6²: Bot. 340 (1841).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 94 (1931); Chambers in Maiden, *Agric. Gaz. N.S.W. 10*: t. opp. 725 (1899); Fitch in Hooker f., *Flor. Tasm. 2*: t. 159 A, *col.* (1859).

Vern.: Bent. *Distr.*: Scattered in wet places in cooler parts of western Victoria (Upper Loddon R., Ballarat, ? Pyrenees, Port Fairy, Lower Glenelg R.), but frequent on alpine and subalpine grassland above 4000 ft. (Mt. Buller, Dargo & Bogong High Plains, Mt. Feathertop, Mt. Hotham, The Twins, Cobboras, Nunniong plateau); Tas., N.S.W.; W.A.

—Leaf-blade *flat*, 2-8 mm. wide (rarely <2 mm.); ligule 4-8 mm. long, \pm pubescent; spikelets 5-8 mm. long (usually straw-coloured, seldom purplish); rhachilla produced into a *plumose bristle* (1-2 mm. long) at side of flower; palea $\frac{2}{3}$ the length of lemma; callus *densely bearded*; anthers \pm 1 mm. long:

294. *A. billardieri* R. Br. Prodr. Flor. Nov. Holl. 171 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 117 (1943); Cheeseman, *Ill. N.Z. Flor.* t. 223 (1914), as "*Deyeuxia billardieri*"; Buchanan, *Indig. Grasses N.Z.* t. 23 (1879); Labillardière, *Nov. Holl. Plant. Specim. 1*: t. 31 (1804), as "*Avena filiformis*".

Vern.: Blown Grass. *Distr.*: Rather frequent on sand-dunes all along the Victorian coast (noted at Mallacoota, Ram Head, Lakes Entrance, Wilson Prom., Cape Schanck, Port Phillip Bay, Anglesea, Port Fairy); Tas., N.S.W., S.A., N.Z.—always coastal.

[The var. *filifolia* J. W. Vickery in *Contr. N.S.W. Nat. Herb. 1*: 110 (1941) differs in its much narrower leaves (1-1.5 mm. wide), fewer-flowered more capillary panicles and long anthers (1.5 mm.); it is more typically an inland grass, and in Victoria is known from Hawkesdale (type locality) and the Little Desert. The var. *robusta* Vickery (*l.c.*) also has narrow leaves, but is a much taller plant (to 2 ft.); apparently the only known Victorian collection is the type from Melbourne (1853), now housed at Kew.]

10. Panicle only shortly exerted at maturity, *not* very widely spreading, the branches *never* drooping; spikelets usually *purplish* at maturity, 3-5-6 mm. long; anthers 0.6-1.2 mm. long:

295. *A. æmula* R. Br. Prodr. Flor. Nov. Holl. 172 (1810).

Illust.: Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. opp. 309 (1892), also *Aust. Grasses* t. opp. 20 (1895)—both as "*Deyeuxia billardieri*".

Vern.: Blown Grass. *Distr.*: Occasional on Victorian grasslands and scattered from the Mallee to far E. Gippsland, ascending also to alps (extreme North-west near Lake Walla-walla, Keilor basalt plains near Melbourne, Cann R. valley, Bogong High Plains at Wild Horse Ck, Mt. Feathertop); all Australian States except Qd, Lord Howe Id.

—Panicle large, *very diffuse* and divaricate, with *drooping branches*; spikelets remaining *pale greenish* (rarely tinged with purple), 2-4 mm. long; anthers <0.6 mm. long:

296. *A. avenacea* J. F. Gmel. Syst. Nat. ed. 13, 2: 171 (1791).

Calamagrostis filiformis (Forst. f., ut *Avena* sp.) Cockayne *Rep. bot. Surv. Tongariro Nat. Park* 35 (1908), *non* Griseb. (1868);

Deyeuxia forsteri (Rich. ex Roem. & Schult., ut *Agrostis* sp.) Kunth *Rév. Gram.* 1: 77 (1829).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 46 fig. B (1952); Grosse in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 45 (1923), as "*A. forsteri*"; Hitchcock, *Manual Grasses U.S.* fig. 460 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*: fig. 328 (1923), as "*A. retrofracta*"; Hayward & Druce, *Advent. Flor. Tweed-side* 237 (1919), as "*Deyeuxia retrofracta*"; Buchanan, *Indig. Grasses N.Z.* t. 21 (1877), as "*A. æmula*"; Bailey, *Ill. Monogr. Grasses Qd 1*: t. [13] (1878), as "*D. solandri*".

Vern.: Blown Grass. *Distr.*: Frequent in moist situations throughout the whole of Victoria (Mallee, plains, western highlands, coast, Goulburn Valley, eastern highlands, E. Gippsland etc.), ascending to subalpine localities but rare in the alps proper (e.g. Mts. Feathertop & St. Bernard); all Australian States, N.Z., Polynesia, Hawaii, and an occasional introduction in western U.S.A.

[The var. *perennis* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 114 (1941) differs in having a perennial rhizome, more rigid culms and slightly longer anthers (0.7 mm.); it is recorded from the Yarra River and Wando Vale near Casterton in Victoria.

Agrostis adamsonii Vickery l.c. 107-8 (1941) was based on a single old collection from Melbourne, now in Kew Herbarium; but the plant has never been re-discovered in Australia. It is near to *A. billardieri* R. Br., differing in the smaller spikelets (3-3.5 mm. long) and straight, only shortly exerted awn. **A. canina* L. (Velvet Bent), of Eurasia and eastern North America, is occasionally used as a lawn grass; closely resembling *A. stolonifera* in habit, it differs in having looser panicles, lemmas awned from the base and the palea minute.]

114. *POLYPOGON Desf. (1798)

Each glume only *slightly notched, shortly ciliate* with appressed hairs, appearing \pm *truncate* at apex; awn of glume 4-7 mm. long, pale yellow-green, almost *terminal* (widespread throughout State):

297. **P. monspeliensis* (L.) Desf. *Flor. atlant.* 1: 67 (1798).

Alopecurus monspeliensis L. *Spec. Plant.* 1: 61 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 42 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 115 (1943); Morris in Ewart, *Flor. Vict.* fig. 87 (1931); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 74 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 284 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 510 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 325 (1923); Herter, *Flor. il. Uruguay* 1: fig. 386 (1942); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1180 (1931); Poincot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3078, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 4020 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 94 (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1416 (1834).

Vern.: Annual Beard-grass (Rabbit-foot Grass—U.S.A.). *Distr.*: Indigenous almost throughout Eurasia and N. Africa; introduced into S. Afr., N. & S. Amer., N.Z., all Australian States, and frequent in damp places almost throughout lowland Victoria (e.g. Far North-west, Rainbow, Creswick, Colac, Anglesea, Melbourne district, Phillip Id, Graytown, Cornishtown) but seldom noted in E. Gippsland.

[The Perennial Beard-grass, *Agropogon littoralis* (Sm.) C. E. Hubbard, is a noteworthy intergeneric hybrid between *Polypogon monspeliensis* and *Agrostis stolonifera* L.; it appears occasionally in the Greater Melbourne area and was first noted at Fisherman's Bend, Port Melbourne, in Nov. 1919. This hybrid differs from both parents in being male-sterile, and has awns no more than twice the length of the narrowish glumes (cf. *P. monspeliensis*). *P. lutosus* (Poir.) Hitchc., 1920, is a synonym, and the plant is admirably illustrated by Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 282 (1954).]

Each glume *deeply cleft* into 2 *acutish* lobes, *long-ciliate*, the hairs at base stiff and spreading; awn of glume \pm 4 mm. long, often *pink or purplish*, springing from base of notch and toward *centre* of glume (uncommon coastal grass, seldom >4" high):

298. **P. maritimus* Willd. in *Neue Schr. Ges. naturf. Fr. Berl.* 3: 443 (1801).
Illust.: Hitchcock, *Manual Grasses* U.S. ed. 2: fig. 511 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 326 (1923); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3078 b, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 4019 (1906); Reichenbach, *Icon. Flor. germ.* 7: t. 75, col. (1845).
Vern.: Coast Beard-grass. *Distr.*: Indigenous to the Mediterranean region; introduced into S. Afr., N. Amer., N.Z., S.A., and appearing as an occasional annual in sandy coastal areas of western Victoria (Geelong, Warrnambool, Cape Bridgewater near Portland, Lower Glenelg R.) also at Dimboola.

115. **GASTRIDIMUM* Pal. Beauv. (1812)

299. **G. phleoides* (Nees & Meyen) C. E. Hubbard in *Kew Bull.* 1954: 375 (1954).

Lachnagrostis phleoides Nees & Meyen in *Nova Acta Leop. Carol.* 19, suppl. 1: 146 (1843).

Illust.: Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 45 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 120 (1943); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83 fig. 121 (1940); Hitchcock, *Manual Grasses* U.S. ed. 2: fig. 518 (1951); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 67 (1955)—all except the last as "*G. ventricosum*".

Vern.: Nit-grass. *Distr.*: Indigenous to the Mediterranean region and N.E. Africa; introduced into S. Afr., N. & S. Amer., N.Z., N.S.W., S.A., W.A., and Victoria where an occasional weed of pastures or waste ground (e.g. Bundoora and Stawell).

Diagn.: Harsh, ± glabrous annual up to 18" high; leaf-blades 1-3" long, 2-3 mm. wide, flat, finely pointed, roughish along the margins; ligule lanceolate, 3-4 mm. long, hyaline, rigid, soon torn; panicle cylindrical, very dense and spike-like, 2-4" long, 5-8 mm. thick, tapering at both ends, ± silvery; spikelets erect, 1-flowered, 5-6 mm. long, swollen and ± globular at base; glumes persistent, lanceolate, keeled, hard and shining at the swollen base, unequal, the lower 5-6 mm. long and upper ± 4.5 mm. long; lemma very short, truncate-ovate, 1-1.5 mm. long, membranous, pubescent all over, with fine ± bent awn (5-7 mm. long) arising well below the toothed obtuse apex, 5-nerved; palea subequal, 2-nerved; anthers purplish, ± 0.7 mm. long.

[*G. phleoides* has been much confused with a related European and N. African species, *G. ventricosum* (Gouan) Schinz & Thell. which differs in its much shorter lower glume (3-5 mm. long) and lemma with glabrous back.]

116. **LAGURUS* L. (1753)

300. **L. ovatus* L. *Spec. Plant.* 1: 81 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 44 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 123 (1943); Morris in Ewart, *Flor. Vict.* fig. 91 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 119 (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.*: fig. 68 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 288 (1954); Hitchcock, *Manual Grasses* U.S. ed. 2: fig. 519 (1951); Bailey, *Stand. Cycl. Hort.*, popular ed.: fig. 2062 (1939); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 366 (1923); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1179 (1931); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3079, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 4021 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 28 fig. 3, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1415 (1834).

Vern.: Hare's-tail. *Distr.*: Indigenous to Mediterranean coasts; introduced into W. Europe, S. Afr., N. & S. Amer., N.Z.; all Australian States, and frequent on coastal dunes in several parts of southern Victoria (Lakes Entrance, Phillip Id, Cape Schanck, Port Phillip Bay, Torquay, Anglesea etc.).

Diagn.: Softly hairy annual to 2 ft. high (but often only 2-6"); leaf-blades grey-green, linear to narrow-lanceolate, to 8" long, 2-15 mm. wide, flat, \pm dilated at auricles; ligule to 3 mm. long, blunt, membranous, hairy; panicle dense and spike-like, to 2" long and 1-2 cm. wide, globose, ovoid or shortly cylindrical, villous-hairy and very soft to touch, grey-green to purplish; spikelets erect, 1-flowered, 8-10 mm. long, densely overlapping; glumes persistent, equal, to 10 mm. long, narrow-lanceolate, 1-nerved, tapering into fine bristles or plumose awns and covered with soft spreading hairs; lemma elliptic, 4-5 mm. long, 5-nerved and shortly hairy near base, with 2 short terminal awns and 1 bent dorsal awn to 15 mm. long; palea shorter, 2-keeled; anthers 1.5-2 mm. long.

117. *PHLEUM L. (1753)

301. *P. pratense L. *Spec. Plant.* 1: 59 (1753).

Illustr.: Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 44 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 685 (1952); Morris in Ewart, *Flor. Vict.* fig. 90 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 120 (1940); *J. Dep. Agric. S. Aust.* 10: 605 (1907); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 296 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 516 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 311 (1923); Herter, *Flor. il. Uruguay* 1: fig. 393 (1942); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1170 (1931); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3009, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3936 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 26 fig. 3, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1483 (1834).

Vern.: Timothy Grass (Meadow Cat's-tail). *Distr.*: Indigenous throughout N., W. and Cent. Europe; introduced into many temperate countries (N. & S. Amer., N.Z., all Australian States except Qd) and scattered through cooler parts of Victoria where much valued for pasture purposes, even in the subalps (e.g. Torquay, Cobungra, Dargo & Bogong High Plains).

Diagn.: Tufted perennial 1-5 ft. high; leaf-blades flat, up to 18" long and 3-9 mm. wide, finely pointed, glabrous to \pm rough all over, often grey-green; ligule blunt, membranous, to 6 mm. long; culms rather stout, 3- to 6-noded, the basal internodes often \pm bulbous; panicle very dense, spike-like, cylindrical, 2-6" long (sometimes more) and 6-10 mm. wide, greyish-green to purplish; spikelets congested, each 3-4 mm. long, 1-flowered, oblong, much flattened; glumes persistent, equal, 3-4 mm. long, narrow-oblong, their prominent keels fringed with stiff, white, spreading hairs, each produced into a rigid, scabrid awn 1-2 mm. long, and the lower glume softly hairy on margins; lemma 2-3 mm. long, very broad and blunt, 5- to 7-nerved, membranous, minutely pubescent; palea equal to lemma; anthers 2 mm. long.

118. ALOPECURUS L. (1753)

1. Awn very short, hardly exceeding glumes and \pm enclosed by them; anthers orange-yellow, <1.5 mm. long; spikelet <2.5 mm. long (annual or short-lived non-creeping perennial of wet places):

302. *A. æqualis Sobol. *Flor. Petropol.* 16 (1799).

Illustr.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 302 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 505 (1951); Poinset in Bonnier, *Flor. compl.*

Franc., Suisse & Belg. 11: fig. 3016 b, col. (1930-31), as "*A. fulvus*"; Coste, *Flor. Franc. 3*: fig. 3945 (1906), as "*A. fulvus*"; Pfenninger in Hegi, *Ill. Flor. Mittel-Eur. 1*: t. 26 fig. 6, col. (1907), as "*A. fulvus*"; Reichenbach, *Icon. Flor. germ. 1*: fig. 1476 (1834), as "*A. fulvus*".

Vern.: Orange Fox-tail (Short-awn Fox-tail). *Distr.*: Indigenous throughout Europe, temperate Asia and N. America; introduced into Victoria where naturalized in several parts of Wimmera and Mallee irrigation settlements, on wet or muddy ground (Kalkee near Horsham, Lowan Shire, Red Cliffs, Kerang, Mt. Wycheproof), but apparently not recorded from any other State nor from New Zealand.

—Awn *conspicuous*, projecting far beyond glumes; anthers *yellow or purple* (creeping perennials) 2

2. Culm *ascending* from a geniculate base, often rooting at nodes, <18" long, panicle *narrow* (3-7 mm. wide); glumes *obtus*, 2.5-3.5 mm. long, *shortly ciliate* on keels; anthers 1.5-2 mm. long:

303. *A. geniculatus* L. *Spec. Plant. 1*: 60 (1753).

A. australis Nees in Hook. *Lond. J. Bot. 2*: 412 (1843).

Illust.: Gardner, *Flor. W. Aust. 1¹* (Gramineæ): t. 43 fig. B (1952), as "*A. australis*"; Morris in Ewart, *Flor. Vict.* fig. 86 (1931); Grosse in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 127 (1923); Grosse in Turner, *Aust. Grasses* t. opp. 1 (1895); Buchanan, *Indig. Grasses N.Z.* t. 5 (1877); Sampson in Hubbard, *Pelican Book A* 295: 306 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 58 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 506 (1951); Herter, *Flor. il. Uruguay 1*: fig. 396 (1942); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1176 (1931); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg. 11*: fig. 3016, col. (1930-1931); Coste, *Flor. Franc. 3*: fig. 3944 (1906); Hegi, *Ill. Flor. Mittel-Eur. 1*: fig. 93 d-f (1907); Reichenbach, *Icon. Flor. germ. 1*: fig. 1477 (1834).

Vern.: Marsh Fox-tail (Knee-jointed or Floating Fox-tail). *Distr.*: Indigenous throughout Europe, N. Asia and N. America; doubtfully native to the Southern Hemisphere where widespread in S. Amer., N.Z., all Australian States, and a frequent Victorian grass of wet, open places in such widely dispersed localities as the extreme North-west, Lake Albacutya, Casterton, Penshurst, Creswick, Bacchus Marsh, Torquay, Melbourne area, Neerim, Graytown, Mitta Mitta, Benambra (but not in alps).

[C. A. Gardner in *Flor. W. Aust. 1¹* (Gramineæ): 143 (1952) restores Nees's name *A. australis* for apparently indigenous populations; but the writer agrees with Miss J. W. Vickery, in *Contr. N.S.W. Herb. 2*: 78 (1953), that these cannot be distinguished specifically from *A. geniculatus* as it occurs in Europe and other countries. Vickery (*l.c.*) considers the species as an early introduction into Australia, rather than a native plant, and thus it is also regarded in New Zealand.]

—Culm *erect*, 1-3 ft. long; panicle *broadish*, 7-10 mm. wide; glumes *acute*, 4-6 mm. long, fringed with *long cilia* on keels; anthers 2-3 mm. long:

304. **A. pratensis* L. *Spec. Plant. 1*: 60 (1753).

Illust.: Gardner, *Flor. W. Aust. 1¹* (Gramineæ): t. 43 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 113 (1943); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z. 83*: fig. 118 (1940); Sampson in Hubbard, *Pelican Book A* 295: 308 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 502 (1951); Herter, *Flor. il. Uruguay*

1: fig. 394 (1942); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1175 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3011, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3941 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 26 fig. 5, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1478 + d & e (1834).

Vern.: Meadow Fox-tail. *Distr.*: Indigenous to and widespread in Europe and N. Asia; introduced into N. & S. Amer., N.Z., all Australian States except Qd (?), and of occasional scattered occurrence in Victoria (e.g. the Geelong-Corio district).

[*A. myosuroides* Huds. (Slender Foxtail) has been recorded for Victoria under the synonymous name *A. agrestis* L., and pronounced as "widely spread" in Ewart's *Flor. Vict.* 168 (1931). However, the only voucher specimen in Melbourne Herbarium is one from C. Walter's collection labelled "Goulburn, Dec. 1900", and its origin is doubtful. The species has not been observed anywhere in the State during recent years, and is now omitted. It is an annual with rather long, narrow inflorescence and almost glabrous glumes about 6 mm. long.]

119. AMPHIPOGON R. Br. (1810)

Plant with contracted *horizontal rhizomes*; leaf-blades <3" long (usually <2"); panicle *capitate*, ovoid to broadly oblong, up to 2 cm. long but 1 cm. wide or more; lemma (including awns) 8-12 mm. long, the cilia *diminishing* toward scabrous awn-tips; anthers \pm 4 mm. long:

305. *A. strictus* R. Br. *Prodr. Flor. Nov. Holl.* 175 (1810)

var. *setifer* Benth. *Flor. aust.* 7: 598 (1878).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 62 (1931); Maiden, *Agric. Gaz. N.S.W.* 20: t. opp. 733 (1909).

Vern.: Grey-beard Grass. *Distr.*: Confined in Victoria to sandy ground of western heathlands and open scrubby woodland where locally frequent (Little Desert, Grampians, Glenelg R. near Casterton, Brisbane Range, Anglesea), with isolated records also for the Seymour and Sale districts; also S.A., W.A.

[The typical form of the species, extending from the Blue Mtns. (N.S.W.) northward to S. Queensland, differs in having few or no dorsal cilia on the upper part of glumes and in the slightly shorter lemmas (9-10 mm.)—*teste* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 292-93 (1950).]

Plant *tufted* or with very short \pm oblique rhizomes; leaf-blades usually 3-6" long; panicle *oblong to narrow-cylindrical*, 2-4 cm. long, <1 cm. wide; lemma (including awns) 6-8 mm. long, the cilia continuing (without reduction) right to awn-tips; anthers \pm 3 mm. long:

306. *A. caricinus* F. Muell. in *Linnaea* 25: 445 (1853).

Illust.: Gardner, *Flor. W. Aust.* 1^a (Gramineæ): t. 40 fig. E-G (1952); Black, *Flor. S. Aust.* ed. 2: fig. 100 (1943); Turner, *Agric. Gaz. N.S.W.* 3: t. 46 (1892); Grosse in Turner, *Aust. Grasses* t. opp. 2 (1895)—all as "*A. strictus*".

Vern.: Long Grey-beard Grass (Bearded Heads). *Distr.*: Restricted in Victoria to the Murray Mallee of the Far North-west, on arid sand-hills or sandy plains where localized (e.g. Kulkyn Nat. Forest), also parts of the Big Desert (e.g. Murrawong Parish north of Lillimur); all States except Tas., Cent. Aust.

120. ECHINOPOGON Pal. Beauv. (1812)

Panicle ovate, stiffly *erect*; spikelet (excluding awn) 3-5 mm. long; lemma *minutely bilobed* or subentire at apex; anthers <2 mm. long (culm usually *very scabrid*):

307. *E. ovatus* (Forst. f.) Pal. Beauv. *Ess. Agrost.* 42, t. 9 fig. 5 (1812).

Agrostis ovata Forst. f. *Flor. Ins. Aust. Prodr.* 8 (1786).

Illust.: Palisot de Beauvois (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 45 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 112 (1943); Morris in Ewart, *Flor. Vict.* fig. 67 (1931); Turner, *Agric. Gaz. N.S.W.* 3: t. opp. 388 (1892); Bacchus, *Annu. Rep. Dep. Agric. Vict.* 2: t. 15 (1874), as "*Cinna ovata*"; Buchanan, *Indig. Grasses N.Z.* t. 13 B (1877); Labillardière, *Nov. Holl. Plant. Specim.* 1: t. 21 (1805), as "*Agrostis ovata*"; Hubbard in Hutchinson, *Fam. flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 434 (1959).

Vern.: Hedgehog-grass (Rough-bearded Grass). *Distr.*: A frequent inhabitant of cool, shaded forests, often in rocky situations, ranging in Victoria from the Lower Glenelg R. to the sources of the Murray and to Mt. Drummer in E. Gippsland (e.g. Grampians, Otways, Wombat Forest, Mt. Macedon, Dandenongs, Upper Yarra Ranges, Delatite R., Myrtleford, Limestone Ck, Bogong foothills, Mt. Ellery, Snowy R. gorge, Lakes Entrance, Mt. Wellington, Wilson Prom.), but not in the alps proper and avoiding all open or dry places (Mallee, Wimmera, northern plains etc.); all States, N.Z.

Panicle ovate-oblong, sometimes *nodding* or *inclined*; spikelet (excluding awn) 6-10 mm. long; lemma with *setiform* apical lobes 2-3 mm. long; anthers 2-5-3 mm. long (culm *minutely scabrid* or almost smooth):

308. *E. cheelii* C. E. Hubbard in *Hook. Icon. Plant.* 33: sub t. 3261, p. 3 (1935).

Illust.: Nil.

Vern.: Long-flower Hedgehog-grass. *Distr.*: Restricted in Victoria to steep montane forest of the far eastern highlands and not common (Upper Dargo R., Limestone Ck, Buckwong R. & Tom Groggin on the Upper Murray); also N.S.W.—from Kosciusko region northward through the tablelands to Ben Lomond and Moona plains.

121. PENTAPOGON R. Br. (1810)

309. *P. quadrifidus* (Labill.) Baill. *Hist. Plant.* 12: 280 (1893).

Agrostis quadrifida Labill. *Nov. Holl. Plant. Specim.* 1: 20, t. 22 (1805).

Illust.: Labillardière (*l.c.*); Morris in Ewart, *Flor. Vict.* fig. 92 (1931); Grosse in Turner, *Aust. Grasses* t. opp. 46 (1895), also in *Agric. Gaz. N.S.W.* 3: t. opp. 541 (1892)—both as "*P. billardieri*".

Vern.: Five-awned Spear-grass. *Distr.*: Not uncommon in rather open, often dryish woodlands of Victoria, ranging from the Lower Glenelg R. to the borders of New South Wales near Genoa & Mallacoota (e.g. at Black Range south from Horsham, Ararat, Hawkesdale, Skipton, Creswick, Garvoc, Mt. Gellibrand, Warrandyte, Marlo, Cann R., Suggan Buggan, Graytown), but absent from Mallee, Wimmera, northern & western plains and alps; N.S.W., S.A. (Mt. Lofty Range and rare), Tas. (frequent).

Diagn.: Variable, erect annual or short-lived perennial, usually 1-2 ft. high; leaf-blades 3-7" long, strongly involute but 2-3 mm. wide when flattened out, glabrous to scabrid or even densely pubescent, finely pointed; ligule 1-2 mm. long, obtuse, membranous; panicle 2-6" long, to 1" wide, moderately dense to rather open, light brownish; spikelets narrow, 1-flowered; glumes persistent, thin, narrow-lanceolate, acute, \pm keeled, the lower 6-9 mm. long and 1-nerved, the upper 9-15 mm. long and 3-nerved; body of lemma \pm 4 mm. long, fusiform, 2-lobed at apex, with a long central awn and 2 short erect capillary awns (7-8 mm. long) terminating each lobe; central awn with rigid twisted column 5-10 mm. long and an inclined \pm straight bristle 10-15 mm. long; callus short, bluntish, surmounted by a tuft of white hairs; anthers narrow-linear, 2-3 mm. long.

[The Eurasian *Apera spica-venti* (L.) Pal. Beauv. (Loose Silky-bent) is also in the tribe *Agrostideæ* and close to *Agrostis*, from which genus *Apera* differs in having a straight terminal awn 2 or 3 times as long as the exerted lemma. Morris in Ewart's *Flor. Vict.* 184 (1931) records this annual grass as "mainly in N.E. Victoria", but the only specimen in Melbourne Herbarium purporting to have been gathered in the State is labelled "Goulburn, 1903"; it is from C. Walter's collection, and of dubious origin. No recent collector, including the writer, has ever seen *A. spica-venti* in Victoria, nor is it recorded from any other State; occurrences in New Zealand are reported as rare.]

Tribe ZOISIEÆ

122. ZOISIA Willd. (1801)

Culm usually $>2''$ high; leaf-blades *long-pungent*; spikelet 3-5 mm. long, \pm *acuminate*, the glume usually mucronate or even tipped with an awn 1-2 mm. long; anthers 1-5-2 mm. long:

310. *Z. macrantha* Desv. *Opusc. Sci. phys. & nat.* 54 (1831).

Z. pungens sens. R. Br. *Prodr. Flor. Nov. Holl.* 208 (1810), atque Morris in Ewart *Flor. Vict.* 119 (1931), *non* Willd. (1801).

Illust.: Atkinson in Hubbard, *Hook. Icon. Plant.* 33; t. 3264 (1935); Morris in Ewart, *Flor. Vict.* fig. 38 (1931), as "*Z. pungens*"; Turner, *Agric. Gaz. N.S.W.* 3; t. opp. 231 (1892), as "*Z. pungens*".

Vern.: Prickly Couch. *Distr.*: Occasional along the coastline of eastern Victoria, from Cape Howe to Port Phillip Bay (e.g. at Betka R. mouth, Cape Conran, Lake Wellington, Tooradin, Seaholme & Port Melbourne), inhabiting salt-marsh and forming mats on adjoining sand-dunes; Tas. (Bass Strait islands), N.S.W., Qd, but *not* in N.Z. where the species previously called "*Z. pungens*" is of uncertain affinity.

Culm seldom exceeding $2''$ (often $<1''$ high); leaf-blades \pm *shortly pungent*; spikelet 2-3 mm. long, *broadly acute* or blunt, the glume often shortly mucronate; anthers \pm 1 mm. long:

311. *Z. matrella* (L.) E. D. Merrill in *Philipp. J. Sci. (Bot.)* 7: 230 (1912).

Agrostis matrella L. *Mant. Plant.* 2: 185 (1771);

Zoisia pungens Willd. in *Neue Schr. Ges. naturf. Freund. Berl.* 3: 441 (1801).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 66 (1943); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 76 (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 714 (1951); Wallis in Dayton, *Yearb. Agric. U.S. Dep. Agric.* 700 (1948).

Vern.: Manila Grass. *Dist.*: Localized and rare in Victoria where known only from saline ground in the Dimboola district; S.A. (Port Lincoln & Rocky R. on Kangaroo Id), Mauritius, India, E. Asia, Philippine to Solomon Is; introduced into U.S.A.

[The few, isolated occurrences of this tropical grass in southern Australia strongly suggest that it is an introduction here and not truly indigenous, as is *Z. macrantha* of the eastern coast.]

123. TRAGUS Scop. (1777)

312. *T. australianus* S. T. Blake in *Pap. Dep. Biol. Univ. Qd* 1¹⁸: 12 (1941).

T. racemosus sens. Morris in Ewart *Flor. Viet.* 118 (1931), atque auctt. Aust. plur., non (L., ut *Cenchrus*) Ail. (1785).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Graminæ): t. 54 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 67 (1943); Morris in Ewart, *Flor. Viet.* fig. 36 (1931), as "*T. racemosus*"; Wills in Maiden, *Manual Grasses N.S.W.* t. opp. 64 (1898), also in *Agric. Gaz. N.S.W.* 7: t. opp. 130 (1896), both as "*Lappago racemosa*".

Vern.: Small Bur-grass. *Dist.*: Localized and rare in Victoria where confined to sandy-open parts of the northern Mallee (Murrayville, at Mildura Cemetery and Beverford near Swan Hill); drier parts of all States except Tas., N. Terr., also N. Cal.

Diagn.: Ascending annual 4-12" high; leaf-blades 1-3" long, 3-6 mm. wide, flat, linear-lanceolate, acute, somewhat bluish, glabrous but boldly and rigidly serrulate-ciliate along the whitish margins; ligule a short collar of dense hairs; culms pale, smooth and shining, 3- to 4-noded, \pm geniculate at nodes; panicle 2-4" long and up to 10 mm. wide, narrow, dense and spike-like, bristly from the bur-like spikelets; spikelets in pairs and erect on a very short common peduncle which falls with them, each with \pm smooth surface facing inwards; lower glume rudimentary or absent; upper glume hard, 3.5-4.5 mm. long, \pm boat-shaped, with 5 dorsal rows of thickened nerves bearing stout, hooked, upwardly curved prickles; lemma and palea thin, hyaline, whitish \pm 2 mm. long; anthers minute, 0.3 mm. long, pallid cream; grain linear-fusiform, 1.5-2 mm. long, bright brown.

Tribe ERAGROSTIDÆ

124. DIPLACHNE Pal. Beauv. (1812)

313. *D. fusca* (L.) Pal. Beauv. *Ess. Agrost.* 163 (1812), in index sub *Festuca fusca*.

Festuca fusca L. *Spec. Plant.* ed. 2, 1: 109 (1762).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 142 (1943); Grosse in Turner, *Aust. Grasses* t. opp. 23 (1895); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 90 (1955); Phillips, *S. Afr. Grasses* t. 95 (1931); Franks in Wood, *Natal Plant.* 5: t. 410 (1904); Herter, *Flor. il. Uruguay* 1: fig. 314 (1941).

Vern.: Brown Beetle-grass. *Dist.*: In Victoria restricted to inundated heavy soils of the Murray R. flood-plain, in river swamps, lagoons and around water-holes (e.g. at Mildura and Gunbower), but probably overlooked on account of

its resemblance to *Eragrostis parviflora*, and precise range unknown; throughout warmer, periodically flooded country in all States except Tas., N. Terr., Indonesia, Philippines, tropical Asia, tropical & S. Afr., but introduced into S. Amer.

Diagn.: Perennial or biennial from 6" to 3 ft. high; leaf-blades 6-12" long, 1-2 mm. wide when flattened out, usually \pm inrolled, acute, glabrous to slightly scabrid; ligule 3-6 mm. long, narrow, membranous, soon torn; panicle 4-16" long, rather wide and loose but with erect capillary branches; spikelets 8-15 mm. long, 6- to 14-flowered, leaden-coloured, linear, \pm sessile; glumes subequal, obtusish, hyaline, 1-nerved, \pm 2-keeled, awnless, the lower 3-4 mm. long and upper 4.5-5 mm.; lemmas closely overlapping, each 4-5 mm. long, broad, \pm flattened, obtuse, membranous, 3-nerved, the mid-nerve produced as a mucro or very short awn in the apical notch, and all nerves silky-villous for the lower $\frac{2}{3}$; palea subequal, also villous along its nerves; anthers \pm 1 mm. long, linear, yellow; grain obovoid-oblong.

125. TRIPOGON Roth (1821)

314. *T. loliformis* (F. Muell.) C. E. Hubbard *Kew Bull.* 1934: 448 (1934).

Festuca loliformis F. Muell. *Fragm. Phyt. Aust.* 8: 128 (1873);

Diplachne loliformis (F. Muell.) F. Muell. ex Benth. *Flor. aust.* 7: 618 (1878).

Illust.: Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 41 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 143 (1943); Morris in Ewart, *Flor. Vict.* fig. 102 (1931), as "*Diplachne loliformis*"; Burton in Maiden, *Agric. Gaz. N.S.W.* 13: t. opp. 723 (1902), as "*Diplachne loliformis*".

Vern.: Rye Beetle-grass. **Distr.:** In Victoria scattered on dryish grassland in the south and north-east, but localized and uncommon (Lara on basaltic plains, Upper Murray near Walwa, Suggan Buggan in open pine-box woodland); all States except Tas., Cent. Aust. & tropical North Australia.

Diagn.: Small annual or biennial, up to 9" high (seldom > 1 ft.); leaves basal, with white sheaths, the blades \pm 1" long (rarely to 2"), very narrow-linear, \pm involute, to 1 mm. wide when flattened out, glabrous to silky-hairy on under-side; ligule membranous, 0.5-1.5 mm. long, soon torn and often hairy; inflorescence a slender, simple, terminal, rather open spike 1-4" long; spikelets 6- to 14-flowered, 5-12 mm. long, \pm cylindrical, sessile and erect in 2 rows along one side of the narrow flattened rhachis; glumes persistent, obtuse, subequal, the lower \pm 2 mm. long and upper 2-3 mm. long with 3 nerves; lemma 2-3 mm. long, obtuse, with short bearded callus, glabrous, 3-nerved, the mid-nerve produced into a short slender awn slightly exceeding the apical notch; anthers purplish, microscopic, 0.2-0.3 mm. long; grain amber, fusiform, 1.5 mm. long.

126. TRIRAPHIS R. Br. (1810)

315. *T. mollis* R. Br. *Prodr. Flor. Nov. Holl.* 185 (1810).

Illust.: Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 23 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 138 (1943); Morris in Ewart, *Flor. Vict.* fig. 63 (1931); Grosse in Turner, *Aust. Grasses* t. opp. 54 (1895), also in *Agric. Gaz. N.S.W.* 3: t. opp. 643 (1892).

Vern.: Needle Grass. **Distr.:** Localized and rare in Victoria where known from only a few localities on Mallee sands in the Far North-west (near Ouyen, Yat-pool near Red Cliffs, Hopetoun); all States except Tas., also N. Terr., usually in arid country.

Diagn.: Erect, rather harsh, glabrous to minutely scabrid perennial up to 2 ft. high (often only 6-12"); leaf-blades 6-12" long, 2-4 mm. wide, usually flat but sometimes involute-setaceous, finely acuminate, often \pm bluish; ligule a collar of dense cilia, those at edges of sheath 3-4 mm. long; inflorescence a dense spike-like panicle 3-10" long, up to 1" wide, cylindrical, soft, usually purplish; spikelets 6- to 9-flowered, 10-15 mm. long, crowded on short erect branches, narrow, silky-hairy; glumes subequal, 4-6 mm. long, glabrous, entire, \pm mucronate; lemmas narrow, \pm 6 mm. long, membranous, 3-lobed and 3-nerved, the nerves produced into 3 erect, capillary, scabrid awns about 6 mm. long (central awn arising from an apical notch at a higher level than lateral pair of awns), ciliate along lateral nerves; anthers minute, whitish, elliptic, 0.3 mm. long; grain amber, narrowly fusiform, 2 mm. long.

127. *ELEUSINE J. Gaertn. (1788)

316. **E. tristachya* (Lam.) Lam. in *Tabl. encycl.* 1: 203 (1792).

Cynosurus tristachyos Lam. in *Encycl. méth. (Bot.)* 2: 188 (1786).

Illust.: Herter, *Flor. il. Uruguay* 1: fig. 319 (1941); Correa, *Diccion. Plant. uteis Brasil* 1: 608-609 (1926); Bettfreund, *Flor. argent.* 2: t. 85 (1900).

Vern.: American Crow's-foot Grass. *Distr.*: Indigenous to temperate and tropical S. America; introduced into S. Afr. (Worcester, 1943), N.Z. (near Napier), Qd, N.S.W., and Victoria where scattered as an occasional weed of lawns or well-watered flats near settlements (e.g. in Melbourne area and Orbst).

Diagn.: Apparently a short-lived perennial to 1 ft. high; leaf-blades glabrous, 2-5" long, strongly keeled, \pm 2 mm. wide when flattened out, obtuse and \pm boat-shaped at apex; ligule a short fimbriate collar \pm 0.5 mm. high; inflorescence a finger-like cluster of 2-4 rigidly diverging spikes at apex of culm; each spike to 1" long (often much less), 7-10 mm. wide, sessile, sometimes purplish; spikelets 2-3 mm. long, narrowly ovoid, several-flowered, hard, rigid, sessile and closely overlapping, disposed in 2 dense rows along one side of the broad rhachis which ends in a spikelet; glumes glabrous, rather obtuse, 1-nerved, unequal, the lower \pm 2 mm. and upper 2.5 mm. long; lemma \pm 3 mm. long, keeled, acute, glabrous, 3-nerved; anthers 0.6-0.8 mm. long, oblong-linear, creamy; grain dark, \pm ovoid, < 1 mm. long.

[Morris in Ewart's *Flor. Vict.* 186 (1931) adopted the name *E. coracana* for the only species of this tropical genus naturalized in Victoria—doubtless owing to confusion of widespread *E. tristachya* with true *E. coracana* (L.) Gaertn. (Indian Millet or Korakan) which has a larger, much heavier head of 4-6 spikes (each 1-2" long) and prominent, globular, millet-like grains. There are only two Victorian-grown specimens of the latter at Melbourne Herbarium—from Melbourne Botanic Gardens (cultivated prior to 1866) and St. Leonards (Apr. 1922)—and the present writer does not consider this Afro-Asian grass to be spontaneous anywhere in the State; it has appeared also at Lake Alexandrina in South Australia, *teste* J. M. Black *Flor. S. Aust.* ed. 2: 518 (1948).]

128. DACTYLOCTENIUM Willd. (1809)

317. *D. radulans* (R. Br.) Pal. Beauv. *Ess. Agrost.* 72 (1812).

Eleusine radulans R. Br. *Prodr. Flor. Nov. Holl.* 186 (1810);

D. ægyptium sens. Morris in Ewart *Flor. Vict.* 186 (1931), *non* (L., ut *Cynosurus* sp.) Richt. (1890).

Illust.: Gardner, *Flor. W. Aust. 1¹* (Gramineæ): t. 62 fig. B (1952); Mahood in Chippendale, *Poison. Plant. N. Terr.* 2: fig. 6 (1958); Black, *Flor. S. Aust.* ed. 2: fig. 181 (1943); Morris in Ewart, *Flor. Vict.* fig. 100 (1931), as "*D. ægyptium*"; Turner, *Agric. Gaz. N.S.W.* 4: t. opp. 151 (1893), as "*Eleusine ægyptiaca*"; Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 377 fig. 89 (1915); Bailey, *Ill. Monogr. Grasses. Qd 1*: t. [17] (1878), as "*Eleusine cruciata*".

Vern.: Finger Grass (Button Grass). *Distr.*: Restricted in Victoria to inundated ground near north-western rivers, but apparently rare and exact range unknown (Lower Murray R., Wimmera—? near Dimboola); all States except Tas., also Cent. Aust. and extending to tropical North Australia.

Diagn.: Small annual 2-12" tall (seldom more), sometimes \pm prostrate; leaf-blades up to 4" long (often <2"), 2-5 mm. wide, flat, acuminate, coarsely scabrid (along margins) to tuberculate-ciliate with long hairs; ligule a short densely ciliate collar; inflorescence a dense digitate cluster of 4-10 spikes at apex of culm; each spike 5-12 mm. long and about 5 mm. wide, sessile, falling intact with spikelets at maturity; spikelets \pm 5 mm. long, 3- to 5-flowered, strongly compressed laterally, sessile and crowded in 2 rows along one side of rachis to which they stand almost at right angles, the axis projecting beyond spikelets as an erect naked point; glumes subequal, 2-3 mm. long, broad, boat-shaped, 1-nerved, mucronate, coarsely scabrid along keels; lemma 4-5 mm. long, 3-nerved, broad, rigid, curved outwards along the prominently scabrid keel, acuminate-mucronate; anthers minute, 0.3-0.4 mm. long, pallid; grain ovoid, granular, \pm 1 mm. long.

129. ERAGROSTIS Pal. Beauv. (1812)

1. Stout inland *perennial* 4-10 ft. high; culms to 4 mm. thick, naked, branched, *hard, cane-like*, with a coating of whitish wax; panicle broad, 4-8" long, loose, spreading, with distant branches; spikelet 5-12 mm. long, almost *terete*, 6- to 12- flowered; lemma hyaline, obtuse, 2-3 mm. long;

318. *E. australasica* (Steud.) C. E. Hubbard in *Kew Bull.* 1941: 26 (1941).
Glyceria australasica, Steud. *Synops. Plant. glumac. 1*: 286 (1854);
G. ramigera (F. Muell., ut *Poa*) Benth. *Flor. aust.* 7: 659 (1878).

Illust.: Gardner, *Flor. W. Aust. 1¹* (Gramineæ): t. 33 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 150 (1943); Wills in Turner, *Agric. Gaz. N.S.W.* 4: t. opp. 222 (1893), as "*Glyceria ramigera*".

Vern.: Cane Grass (Bamboo Grass). *Distr.*: Ranging in Victoria through the northern Mallee region, Wimmera and far west where not uncommon in river swamps, around lakes and on water-logged heavy clay-soils of smaller depressions (e.g. Balmoral, Barber's Lake near Dimboola, Wyperfeld Nat. Park, Kow Swamp, Lake Walla-walla & Berribee Tank in extreme North-west), also in north-east at Glenrowan and Winton Swamps; inland parts of all States except Tas., also Cent. Aust.

—Rare, *tender leafy annual* <1 ft. high; panicle *very delicate*, open, spreading, \pm elongated, 3-10" long, usually with *falsely whorled*, much divided capillary branches; spikelet 1-2 mm. long, flattened, 4- to 8-flowered, the rachilla fragile; lemma obtuse, minute, \pm 0.5 mm. long;

319. *E. japonica* (Thumb.) Trin. in *Mém. Acad. Sci. St. Pétersb. sér. 6 Sci. math. phys. & nat. 1*: 405 (1831).

Poa japonica Thumb. *Flor. japon.* 51 (1784);

E. tenella sens. Morris in *Ewart Flor. Vict.* 159 (1931), atque Benth. (1878), *non* (L.) Pal. Beauv. (1812).

Illust.: Gardner, *Flor. W. Aust. I*¹ (Gramineæ): t. 33 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 148 a-c (1943); Chambers in Maiden, *Agric. Gaz. N.S.W.* 14: t. opp. 607 (1903), as "*E. tenella*"; Makino, *Ill. Flor. Jap.* 820 (1924).

Vern.: Delicate Love-grass. *Distr.*: Localized and extremely rare in Victoria where known from only two collections a century apart—King R. (Mar. 1853) & Caradoc near Red Cliffs (Jan. 1954)—and perhaps a casual adventive from the Australian tropics; Cent. Aust., tropical parts of W.A., N. Terr. & Qd, Indonesia, Japan, tropical Asia, tropical Afr.

—Habit and/or spikelets and glumes *not* as above 2

2. Panicle much <1 ft. long, sometimes congested; if ever broad and diffuse, then the spikelets very flat with a longitudinal furrow between the 2 rows of flowers 4

Panicle \pm 1 ft. long, very wide and loose with long-capillary branches; spikelets slightly flattened, dark olive-greyish, either 2- to 4-flowered with rugulose grains or linear with 6-20 flowers and without any longitudinal furrow 3

3. Spikelet linear, with 6-20 flowers, 4-10 mm. long, on pedicels of almost equal length; lemma narrow, \pm obtuse, 1.5 mm. long; grain smooth, ovoid-oblong;

320. *E. parviflora* (R. Br.) Trin. in *Mém. Acad. Sci. St. Pétersb. sér. 6 Sci. math. phys. & nat. 1*: 411 (1831).

Poa parviflora R. Br. *Prodr. Flor. Nov. Holl.* 180 (1810);

E. pilosa sens. Morris in *Ewart Flor. Vict.* 159 (1931), atque Benth. (1878), *non* (L.) Pal. Beauv. (1812).

Illust.: Grosse in Turner, *Aust. Grasses* t. opp. 26 (1895), also in *Agric. Gaz. N.S.W.* 3: t. opp. 149 (1892); both as "*E. pilosa*".

Vern.: Weeping Love-grass (Soft Love-grass). *Distr.*: Widespread and rather common in northern Victoria on damp soils of the Murray flood-plain and as an occasional weed in irrigation districts (e.g. Far North-west, Echuca, Kyabram and Cornishtown); N.S.W., Qd, S.A., Cent. Aust.

—Spikelet ovate, with 2-4 flowers, 2-3 mm. long, on much longer pedicels (to 20 mm.); lemma broad, \pm acute but manifestly bulging around the fruit; grain globular, vertically ribbed and with raised reticulations:

321. *E. trachycarpa* (Benth.) Domin in *Repert. Spec. nov. Regn. Veg.* 9: 552 (1911).

E. nigra Nees ex Steud. var. *trachycarpa* Benth. *Flor. aust.* 7: 643 (1878).

Illust.: E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 55 (1923), also in *Agric. Gaz. N.S.W.* 29: 630 (1918); Burton in Maiden, *Agric. Gaz. N.S.W.* 14: t. opp. 987 (1903), as "*E. nigra*".

Vern.: Rough-grain Love-grass. *Distr.*: Known in Victoria only by a single collection from Providence Ponds between Stratford and Bairnsdale, Gippsland (Apr. 1955); also N.S.W., Qd.

4. Spikelet very narrow, \pm *terete*, often *purplish*, many-flowered and *without* furrows; leaf-blades *short*, *rigid*, and often involute (Mallee perennials) 7
Spikelet *very flat*, with longitudinal furrows between the 2 rows of flowers 5
5. Pedicels *present*, *equal to or longer than* the dark greyish-green, ovate-oblong spikelets (5-7 mm. long); lemmas 8-12 per spikelet, obtusish, prominently nerved, 2 mm. long (leafy annual to 18"):

322. **E. mexicana* (Hornem.) Link *Hort. bot. Berol.* 1: 190 (1827).

Poa mexicana Hornem. *Hort. Hafn.* 2: 953 (1815).

Illust.: Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 213 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 426 (1923); Herter, *Flor. il. Uruguay* 1: fig. 298 (1941); Pammel & Ball, *Iowa geol. Surv., Suppl. Rep.* 1903: 231 (1904).

Vern.: Mexican Love-grass. *Distr.*: Indigenous to Mexico, California and Texas; introduced into S. Amer., N.S.W., and Victoria where an occasional annual weed of gardens on sandy soil in the Melbourne area (e.g. South Yarra, Toorak, Brighton), also at Buffalo near Foster.

—Pedicels *absent* or very short, the \pm *sessile white or purplish* spikelets in dense *sessile and often interrupted* clusters along a narrow elongated (2-8"), spike-like panicle; lemmas 6-14 per spikelet, acute, 1.5 mm. long (north-western perennial):

323. *E. elongata* (Willd.) J. F. Jacq. *Ecl. Gramin. rar.* t. 3 (1813).

Poa elongata Willd. *Enum. Plant. Hort. berol.* 108 (1809);

E. diandra (R. Br., ut *Poa*) Steud. *Synops. Plant. glumac.* 1: 279 (1854).

Illust.: Jacquin (*l.c.*); Gardner, *Flor. W. Aust.* 1^a (Gramineæ): t. 36 fig. b (1952); Black, *Flor. S. Aust.* ed. 2: fig. 152 (1943); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 50 (1923), also in *Agric. Gaz. N.S.W.* 29: 554 (1918), both as "*E. diandra*"; Burton in Maiden, *Agric. Gaz. N.S.W.* 15: t. opp. 623 (1904), as "*E. diandra*".

Vern.: Close-headed Love-grass (Common Love-grass). *Distr.*: Widespread through the Wimmera, Mallee and Murray Valley districts of Victoria, frequent on inundated sandy ground but extending also to drier grasslands of the Upper Murray R. near Albury (e.g. Mt. Arapiles, Dimboola, Rainbow, Kulkyne Nat. Forest, Mildura, Stawell), with an isolated occurrence on the Gippsland plains near Bairnsdale; all States except Tas., also Cent. & N. Aust., N.G.

—Pedicels *present* but much *shorter than most* of the grey-green spikelets or *all of the purplish ones* 6

6. Leaf-blade *rigid*, \pm *erect*, very narrow to setaceous, *always involute*, seldom longer than 3" (often <1"); spikelets *linear*, *white or purple-tinted*, 10- to 30-flowered; lemma obtusish, <2 mm. long (wiry desert perennial with bulbous woolly rootstock):

324. *E. setifolia* Nees in Hook. *Lond. J. Bot.* 2: 419 (1843).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 35 fig. A (1952); Chambers in Maiden, *Agric. Gaz. N.S.W.* 15: t. opp. 147 (1904).

Vern.: Bristly Love-grass. *Distr.*: Restricted in Victoria to the Mallee region, usually on sandy flats and tolerant of saline soils, but uncommon (Lake Lochiel near Dimboola, Borung, Kulkyn Nat. Forest and around Berribee Tank in the extreme North-west); inland parts of all States except Tas., Cent. Aust.

—Leaf-blade *lax*, spreading, often flat when alive, usually >3" long, the margins quite *smooth*; spikelets ovate to elliptic-oblong, olivaceous or leaden-grey, to 15-flowered and to 2 mm. wide; lemma \pm *acute*, 2 mm. long (widespread *perennial* with rather long, *often remote* panicle-branches; rootstock neither swollen nor woolly):

325. *E. brownii* (Kunth) Nees ex Steud. *Nom. Bot.* 1: 562 (1840).

Poa brownii Kunth *Rév. Gramin.* 112 (1829);

Briza eragrostis L. *Spec. Plant.* 1: 70 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 34 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 153 (1943); Morris in Ewart, *Flor. Vict.* fig. 80 (1931); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 49 (1923), also in *Agric. Gaz. N.S.W.* 29: 553 (1918); Burton in Maiden, *Agric. Gaz. N.S.W.* 15: t. opp. 621 (1904); Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 109 (1940), as "*E. elongata*"; Hitchcock, *Mem. Bishop Mus.* 8³: 130 (1922).

Vern.: Common Love-grass (Brown's Love-grass). *Distr.*: Frequent by rivers, on creek-flats and moist pastures almost throughout Victoria, but uncommon in Far North-west and absent from alps (e.g. in such widely dispersed localities as Melbourne, Dandenongs, Brisbane Range, Colac, Upper & Lower Glenelg R., Poolaigelo, Dimboola, Bendigo, Daylesford, Graytown, Broken R., King R., Bright, Upper Murray R., Gelantipy, Cann R., Mt. Drummer, Mallacoota); all Australian States, tropical N. Aust., introduced into N.Z. and Hawaii.

—As for the last, but a malodorous *annual* with minute *tubercular teeth* on the leaf-margins, spikelets to 30-flowered and to 3 mm. wide, the *obtuse* lemma \pm 2.5 mm. long and short panicle-branches *close together*:

326. **E. cilianensis* (All.) Link ex Lut. in *Malpighia* 18: 386 (1904).

Poa cilianensis All. *Flor. Ped.* 2: 246 (1785);

E. major Host *Icon. Descr. Gramin.* 4: 14, t. 24 (1809).

Illust.: Host (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 34 fig. c (1952); Black, *Flor. S. Aust.* ed. 2: fig. 154 (1943); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 56 (1923), also in *Agric. Gaz. N.S.W.* 29: 78 (1918), both as "*E. major*"; Maiden, *Agric. Gaz. N.S.W.* 23: 582 (1912), as "*E. major*"; Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 126 (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 209 (1951); Silveus, *Texas Grasses* 72 (1933); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 423 (1923); Herter, *Flor. il. Uruguay* 1: fig. 302 (1941); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3149, col. (1934), as "*E. vulgaris*"; Coste, *Flor. Franc.* 3: fig. 4123 (1906), as "*E. major*"; Reichenbach, *Icon. Flor. germ.* 1: fig. 1662 (1834), as "*E. megastachya*".

Vern.: Stink Grass (Black Grass). *Distr.*: Indigenous to the Mediterranean region and tropical Africa; introduced into Pakistan, S. Afr., N. & S. Amer., all Australian States including Tas., and a frequent weed in warmer lowland parts of Victoria, being almost ubiquitous in irrigation districts (e.g. Far North-west, Dimboola, Goulburn Valley).

7. Inflorescence *condensed*, seldom to 3" long; spikelets *sessile*, often *clustered* and \pm curved to one side; lemmas *tightly imbricate*, appressed throughout, *prominently nerved*:

327. *E. dielsii* Pilger in *Bot. Jb.* 35: 76 (1904).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 37 fig. E (1952); Black, *Flor. S. Aust.* ed. 2: fig. 157 (1943); Wills in Maiden, *Manual Grasses N.S.W.* t. opp. 178 (1898), as "*E. falcata*".

Vern.: Mallee Love-grass (Mulka Grass—S.A.). *Distr.*: Frequent on sandy flats almost throughout the Victorian Mallee, and salt-tolerant (Dimboola & Lochiel, Rainbow, Lake Albacutya, Kulkyne Nat. Forest, Mildura, Lake Walla-walla in extreme North-west, etc.); inland parts of all States except Tas., also Cent. Aust.

—Inflorescence *diffuse*, 3-6" long; spikelets *pedicellate*, *distant*, \pm straight; lemmas *loosely imbricate*, *faintly nerved*:

328. *E. lacunaria* F. Muell. ex Benth. *Flor. aust.* 7: 649 (1878).

E. falcata sens. Morris in Ewart *Flor. Vict.* 161 (1931), atque J. M. Black, *Flor. S. Aust.* ed. 2: 121 (1943), *non* Gaudich. (1826).

Illust.: E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 54 (1923), also in *Agric. Gaz. N.S.W.* 29: 629 (1918); Wills in Turner, *Agric. Gaz. N.S.W.* 4: t. opp. 523 (1893).

Vern.: Purple Love-grass. *Distr.*: Restricted in Victoria to the Mallee region where usually inhabiting moist river-flats and depressions, but localized and uncommon (Dimboola, Kulkyne Nat. Forest); inland parts of all States except Tas., also Cent. Aust.

[The South African *E. curvula* Nees (African Love-grass), North American *E. pectinacea* (Michx.) Nees (Carolina Love-grass) and Mediterranean *E. poaeoides* Pal. Beauv. (Smaller Stink-grass) have each appeared once in Victoria—between Drouin and Warragul (Feb. 1913), in the Grampians (Jan. 1904) and at Walpeup Mallee Research Station (May 1950) respectively—but they do not seem to have become established. *E. curvula* is reported as naturalized in Western Australia, New South Wales and New Zealand, *E. poaeoides* in both New South Wales and Queensland.]

130. ELYTROPHORUS Pal. Beauv. (1812)

329. *E. spicatus* (Willd.) A. Camus in Lecompte *Flor. gén. l'Ind.-Chin.* 7: 547 (1923).

Dactylis spicata Willd. in *Neue Schr. Ges. naturf. Freund. Berl.* 3: 416 (1801);

E. articulatus Pal. Beauv. *Ess. Agrost.* 67, t. 14, fig. 2 (1812).

Illust.: Palisot de Beauvois (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 24 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 139 (1943); Morris in Ewart, *Flor. Vict.* fig. 61 (1931), as "*E. articulatus*"; White in Bailey, *Compr. Cat. Qd Plant.* 630

fig. 600 (1913), as "*E. articulatus*"; Chippindall, *Grasses & Pastures S. Afr.* fig. 162 (1955); Lisboa, *Bombay Grasses* 117 (1896), as "*E. articulatus*"; Duthie, *Ill. Fodder Grasses* 72 (1887), as "*E. articulatus*".

Vern.: Spike Grass. *Distr.*: Extremely rare in Victoria, if still present, the sole record being based upon a collection in Melbourne Herbarium labelled "Wimmera" (with neither locality, date nor collector's name), so the occurrence may have been adventive and transitory; inland parts of all States except Tas. but rare in S.A., N. Terr., Japan, tropical Asia & Afr., S. Afr.—edges of rivers, in swamps and lagoons.

Diagn.: Small annual 3-12" tall; leaf-blades 1-4" long, 1.5-3 mm. wide, flat, finely acuminate, glabrous, usually pallid yellowish-green; ligule a short torn membranous collar <0.5 mm. high; culms rigid, minutely pubescent; inflorescence a narrow, very dense cylindrical spike, with spikelets disposed in globular, \pm interrupted clusters 5-10 mm. wide; spikelets extremely numerous, dense, sessile, each to 5 mm. long, 4- to 6-flowered, the uppermost 1-3 florets male or barren; glumes subequal, \pm 3 mm. long, pointed, ciliate on margins, 1-nerved persistent; lemma 4 mm. long, rounded on back, 3-nerved, tapering above into a short scabrid awn; palea \pm 3 mm. long, bifid at summit, with 2 broad, dorsal, hyaline, denticulate wings which clasp the base of the succeeding floret; anthers microscopic, 0.2-0.3 mm. long, elliptical, whitish.

Tribe CHLORIDEÆ

131. CHLORIS Swartz (1788)

1. Spikes 6-16, \pm erect and hardly spreading at maturity; spikelets with 3-4 flowers, only the lowermost fertile; lemmas 2-3 mm. long, acutish, minutely bidentate, with an equal or slightly longer awn:

330. **C. gayana* Kunth *Rév. Gramin.* 293, t. 58 (1830).

C. abyssinica Hochst. in A. Rich. *Tent. Flor. abyss.* 2: 406 (1851).

Illust.: Kunth (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 177 (1943); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 92 (1923); Laurence in Chippindall, *Grasses & Pastures S. Afr.* t. 7 opp. 145, col. (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 760 (1951); Wallis in Dayton, *Yearb. Agric. U.S. Dep. Agric.* 662 (1948); Herter, *Flor. il. Uruguay I*: fig. 351 (1941); Hubbard, *E. Afr. Pasture Plant.* 2: 49 (1927); Burton in Maiden, *Agric. Gaz. N.S.W.* 17: t. opp. 1210 (1906).

Vern.: Rhodes Grass. *Distr.*: Indigenous to Rhodesia; but now widely planted for fodder and naturalized in other parts of S. Afr., Kenya, Abyssinia, India, N. & S. Amer., N.Z., N.S.W., Qd, S.A., W.A. and Victoria where not uncommon along the Murray & Goulburn Valleys (especially in irrigation districts), also sporadic in gardens and damp pastures around Melbourne.

—Spikes widely spreading and windmill-like at maturity; spikelets 2-flowered; awns conspicuous, usually much longer than lemmas 2

2. Lower, fertile lemma narrow-lanceolate, acuminate, 6-7 mm. long (excluding awn), not exceeding the upper and larger glume; upper lemma similar but much shorter; awns 10-15 mm. long:

331. *C. acicularis* Lindl. in Mitch. *J. Exped. trop. Aust.* 33 (1848).

Illust.: Gardner, *Flor. W. Aust. I*¹ (Gramineæ): t. 65 fig. D (1952); Black, *Flor. S. Aust.* ed. 2: fig. 175 (1943); Everist, *Qd agric. J.* 43: t. 173 (1935); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 89 (1923); Grosse in Turner, *Aust. Grasses* t. opp. 16 (1895), also in *Agric. Gaz. N.S.W.* 3: t. opp. 147 (1892).

Vern.: Spider Grass (Curly Windmill Grass, Umbrella Grass). *Distr.*: In Victoria scattered through the Mallee and along the Murray Valley, usually on clay-loam of grassland subject to occasional floods, but uncommon (Dimboola, Yarriambiack Ck, Benetook and other parts of Far North-west, Swan Hill, Nathalia district); inland parts of all States except Tas., also Cent. Aust.

—Lower lemma *very obtuse or rounded* at summit, ± 3 mm. long (without awn), *not* exceeding upper glume, \pm free from the equal but *very truncate* upper lemma; awns 4-10 mm. long (spikelets flattened):

332. *C. truncata* R. Br. Prodr. Flor. Nov. Holl. 186 (1810).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 65 fig. A-B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 178 (1943); Everist, *Qd agric. J.* 44: t. 5 (1935); Morris in Ewart, *Flor. Vict.* fig. 104 (1931); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 87-88 (1923); Grosse in Turner, *Aust. Grasses* t. opp. 17 (1895), also in *Agric. Gaz. N.S.W.* 2: t. opp. 24 (1891); Bacchus, *Annu. Rep. Dep. Agric. Vict.* 2: t. 12 (1874); Hitchcock, *Mem. Bishop Mus.* 8³: 166 (1922); Bailey, *Cycl. Amer. Hort.* 300 (1900).

Vern.: Windmill Grass. *Distr.*: Except for the coast and alps, frequent almost throughout Victoria on grasslands, also in dryish open woodlands (Far North-west, Swan Hill, Dimboola, Murtoa, basalt plains near Creswick, Lower Campaspe R., Lower Goulburn R., Graytown, Nagambie, Keilor basalt plains & Merri Ck near Melbourne, Eildon, Benalla, Cudgewa, Upper Murray R., Suggan Buggan, Bairnsdale); all States except Tas., occasionally cultivated in U.S.A.

—As for the last, but lower lemma *much exceeding* the upper glume (also wrapping around and *almost enclosing the truncate upper lemma*) and spikelets manifestly *swollen* or turgid:

333. *C. ventricosa* R. Br. Prodr. Flor. Nov. Holl. 186 (1810).

Illust.: Everist, *Qd agric. J.* 44: t. 6-7 (1935); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 90 (1923); Chambers in Maiden, *Agric. Gaz. N.S.W.* 11: t. opp. 1007 (1900); Bailey, *Ill. Monogr. Grasses Qd 1*: t. [12] (1878).

Vern.: Plump Windmill Grass (Tall Chloris). *Distr.*: Localized and rare in Victoria (? perhaps only a casual introduction from N.S.W.), being known only from dryish pastures at Springhurst and Suggan Buggan in the north-east and far east respectively; also N.S.W., Qd, and an occasional subject of cultivation in U.S.A.

132. *CYNODON* L. C. Rich. (1805)

Leaf-blades <2 mm. wide (usually <1.5 mm.); spikes 1-3 (usually 2), with spikelets *not* extending right to base; glumes *up to* $\frac{1}{2}$ the length of spikelet; lemmas only slightly ciliate on keels:

334. **C. transvaalensis* Burt-Davy in Kew Bull. 1921: 281 (1921).

Illust.: Laurence in Chippindall, *Grasses & Pastures S. Afr.* t. 6 opp. 144 fig. 3, col. (1955).

Vern.: Florida Grass (Florida Kweek, Germiston Grass, Transvaal Couch). *Distr.*: Indigenous to Transvaal; introduced as a lawn grass to other parts of S. Afr., western U.S.A. (where escaped in places) and north-western Victoria (Horsesham, Mildura district) where established on bowling greens but hardly spontaneous anywhere.

Leaf-blades 2-4 mm. wide; spikes 3-7 (rarely 2), the spikelets extending to very base; glumes at least $\frac{1}{2}$ (and up to $\frac{3}{4}$) the length of spikelet; lemmas densely ciliate along keels:

335. *C. dactylon* (L.) Pers. *Synops. Plant.* 1: 85 (1805).

Panicum dactylon L. *Spec. Plant.* 1: 58 (1753).

Illust.: Mahood in Chippendale, *Poison Plant. N. Terr.* 2: fig. 5 (1958); Everist, *Common Weeds Farm & Pasture* fig. 11 (1957); Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 64 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 172 (1943); Morris in Ewart, *Flor. Vict.* fig. 103 (1931); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 94 (1923); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 111 (1940); Senaratna, *Grasses Ceylon* t. 12 (1956); Laurence in Chippindall, *Grasses & Pastures S. Afr.* t. 6 opp. 144 figs. 1, 4, 5, col. (1955), also Connell *l.c.* fig. 175 (1955); Sampson in Hubbard; *Pelican Book A* 295 (Grasses): 334 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 737 (1951); Herter, *Flor. il. Uruguay* 1: fig. 336 (1941); Trevithick in Hubbard & Vaughan, *Grasses Mauritius & Rodriguez* 52 (1940); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1202 (1931); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3 039, col. (1930-1931); Coste, *Flor. Franc.* 3: fig. 3968 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 31 fig. 1, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1404 (1834).

Vern.: Couch (Doob—India, Kweek—S. Afr., Bermuda Grass—U.S.A.). *Dist.*: Abundant on moist, sandy soils almost throughout lowland Victoria (but absent from dense forest country, arid Mallee sand-hills, and rocky places); all States, Cent. Aust., N.Z., all continents.

[There is some doubt as to whether *C. dactylon* is truly indigenous to Victoria. It was certainly growing along the Murray River between Robinvale and Mildura in the 1850's, and is now almost a cosmopolitan weed in warmer regions of the globe; John Ray recorded it from Cornwall as early as 1688. The South African *C. incompletus* Nees (Blue Couch), which is stoloniferous but *not* rhizomic, was collected from Sydney Botanic Gardens in Jan. 1903; it is now recorded as a naturalized species for New South Wales.

Also referable to the tribe *Chlorideæ* is North American *Bouteloua oligostachya* (Nutt.) Torr. ex A. Gray (Blue Grama) which Morris admitted as naturalized for N.E. Victoria in Ewart's *Flor. Vict.* 189 (1931), under its synonym *B. gracilis* (Humb. et al.) Lag. ex D. Griffiths (1912). The record was based on a single specimen from C. Walter's herbarium, labelled "Goulburn, Nov. 1904" and of dubious origin. Otherwise, the species has never been seen in Victoria since, nor is it known to occur in any other State.

Formerly included with the *Chlorideæ*, but referred to a distinct tribe (*Spartineæ*) by several modern authorities, *Spartina maritima* (Curt.) Fernald—Cord-grass—is now established on tidal mud-flats at Corner Inlet south from Foster, Vic., where it is browsed by local cattle. This rigid, toughly rhizomic and very salt-tolerant perennial (to 2 ft. high) is a native of western Europe and north-west Africa. It differs from representatives of *Chlorideæ* in having stiffly erect, scattered (*never* digitate) spikes with *narrow* spikelets 1 cm. long or more.]

Tribe SPOROBOLÆ

133. SPOROBOLUS R. Br. (1810)

1. *Panicle broadly pyramidal, very loose and delicate, repeatedly divided into fine capillary branchlets; spikelets long-pedicellate, dark, 1-2 mm. long (annual with flat leaf-blades):*

336. *S. caroli* Mez in *Repert. Spec. nov. Regn. Veg.* 17: 299 (1921).

S. lindleyi Benth. *Flor. aust.* 7: 623 (1878) pro parte, non *Vilfa lindleyi* Steud. (1854).

Illust.: E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 44 (1923); Grosse in Turner, *Aust. Grasses* t. opp. 53 (1895), also in *Agric. Gaz. N.S.W.* 3: t. opp. 319 (1892)—all as "*S. lindleyi*".

Vern.: Yakka Grass (Fairy Grass). *Distr.*: Extremely localized and rare in Victoria, if now spontaneous at all (the only 2 collections from the State in Melbourne Herbarium are labelled "Wimmera, 1896" and "Portland"—neither with collector's name and the latter not dated); dry inland parts of all States except Tas., also Cent. Aust.

—Panicle narrow, dense and spike-like (perennials)

2. Leaf-blades >3" long, \pm flaccid but very tough, usually grey-green or bluish; panicle leaden-coloured, 3-10" long (but <8 mm. wide); upper glume shorter than lemma (coarse, densely tufted grass):

337. **S. capensis* Kunth *Enum. Plant.* 1: 212 (1833).

Agrostis capensis Willd. *Spec. Plant.* 1: 372 (1797), non *A. capensis* Lam. (1783);

S. indicus sens. lat. R. Br. *Prodr. Flor. Nov. Holl.* 170 (1810), non *Agrostis indica* L. (1753).

Illust.: Gardner, *Flor. W. Aust.* 1^a (Gramineæ): t. 48 fig. c (1952); Morris in Ewart, *Flor. Vict.* fig. 99 (1931), as "*S. indicus*"; Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 43 (1923), as "*S. indicus*"; Grosse in Turner, *Aust. Grasses* t. opp. 52 (1895), also in *Agric. Gaz. N.S.W.* 5: t. opp. 389 (1894)—both as "*S. indicus*"; Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 110³ (1940); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 198 (1955).

Vern.: Rat-tail Grass (Parramatta Grass). *Distr.*: Indigenous to S. Africa; naturalized and now widespread in India, N.Z., settled areas of all Australian States including Tas., and in Victoria chiefly on sandy coastal soils where frequent (Gabo Id, Lakes Entrance, Stratford, Phillip Id, shores of Port Phillip Bay, Dandenongs, Torquay, Anglesea, etc.).

[This grass is extremely close to *S. indicus* (L.) R. Br., which ranges from southern U.S.A. through the West Indies to Argentina and of which *S. poiretii* (Roem. & Schult.) Hitchcock is a synonym; but differs from the latter in its longer spikelets (2.5-3 mm., against <2.1 mm.). There is still doubt concerning legitimacy of the name *S. capensis*.]

—Leaf-blades <2" long, rigid, erect or slightly spreading, \pm involute-subulate, not distichous; panicle comparatively short, seldom up to 4" long, of pallid hue; glumes never keeled; lemma longer than or \pm equal to upper glume (rare, tufted grass of Murray banks and inland lakes; spikelet sometimes aberrantly 2- or 3-flowered):

338. *S. mitchellii* (Trin.) C. E. Hubbard ex S. T. Blake in *Pap. Dep. Biol. Univ. Qd* 1⁸: 22 (1941).

Vilfa mitchellii Trin. in *Mém. Acad. Sci. St. Pétersb. sér. 6, Sci. math. phys. & nat.* 6²: Bot. 53 (1840).

Illust.: Gardner, *Flor. W. Aust.* 1^a (Gramineæ): t. 48 fig. b (1952); Burton in Maiden, *Agric. Gaz. N.S.W.* 20: t. opp. 222 (1909); Bailey, *Qd Flor.* 6: t. 77 opp. 1880 (1902)—all as "*S. benthami*".

Vern.: Short Rat-tail Grass. *Distr.*: Known in Victoria only by three collections—Sandalong Park on the Murray R. at Mildura (1949), Lake Hindmarsh (1959) and Kerang (1960)—but perhaps overlooked in Murray lands; near inland waters of all States except Tas., but apparently uncommon in S.A., also Cent. Aust.

—As for the last, but leaves \pm *distichous* and rootstock extensively *rhizomic* (creeping through saline sandy ground, both on coast and inland depressions), the panicle \pm *leaden-coloured*, glumes *keeled* and lemma *no longer* than upper glume:

339. *S. virginicus* (L.) Kunth *Rév. Gramin.* 67 (1829).

Agrostis virginica L. *Spec. Plant.* 1: 63 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 48 fig. A (1952); Burton in Maiden, *Agric. Gaz. N.S.W.* 20: t. opp. 52 (1909); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 200 (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 599 (1951); Gleason, *New Britton & Brown Ill. Flor. N.E. United States & Canada* 1: 177 (1952); Britton, *Flor. Bermuda* 26 (1918); Hayata, *Icon. Plant. formos.* 7: fig. 48 (1918); Bryan, *Nat. Hist. Hawaii* t. 51 fig. 14 (1915).

Vern.: Salt Couch (Sand and Mud Couch). *Distr.*: Scattered around the Victorian coast and inhabiting saline marshes or salt-pans of the Mallee (Far North-west, Little Desert, Portland, Anglesea, Barwon Heads, Port Melbourne, Lakes Entrance, Marlo, Cape Conran, Ram Head, Mallacoota); all States, N.Z., N. Cal., Fiji, Hawaii, southern U.S.A., W. Indies, tropical S. Amer., S. Afr., S. W. Afr., India, China, Indonesia, N.G.

Tribe ARUNDINEÆ

134. PHRAGMITES Trin. (1820)

340. *P. communis* Trin. *Fund. Agrost.* 134 (1820).

Arundo phragmites L. *Spec. Plant.* 1: 81 (1753).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 70 (1931); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 201-202 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 322 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 80-81 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 253 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 417 (1923), as "*P. phragmites*"; Herter, *Flor. il. Uruguay* 1: fig. 285 (1941); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1257 (1931), as "*Arundo phragmites*"; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3055, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3985 (1906), as "*Arundo phragmites*"; Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 31 fig. 4, col. (1907); Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 185 fig. 502, col. (1850).

Vern.: Common Reed. *Distr.*: Abundant throughout lowland Victoria on the margins of streams, lagoons, lakes and swamps, from the extreme North-west and Lower Glenelg R. to Howe Range and Upper Murray R. (but absent from alps, jungles and densely forested areas); all States, all continents and practically cosmopolitan (except for N.Z. and Polynesia).

Diagn.: Robust, semi-aquatic perennial 3-9 ft. high, spreading through mud by stout long-creeping rhizomes and stolons, culms rigid, smooth, usually unbranched, leafy and many-noded; leaf-blades 8-24" long and 1-3 cm. wide, glabrous, grey-green, contracted at base and tapering into a long-acuminate point; ligule a dense fringe of short hairs; panicle 6-16" long, erect or finally

nodding, many-branched, sometimes purplish, moderately dense but soft and plume-like; spikelets 10-16 mm. long, 2- to 6-flowered, the lowest floret male and remainder bisexual, lanceolate, at length gaping, the rhachilla with long silky hairs and articulate beneath each lemma; glumes persistent, membranous, 3- to 5-nerved, unequal, the lower 5-6 mm. long and upper 10 mm. long; fertile lemmas membranous, 1- to 3-nerved, very narrow-lanceolate with long fine soft points, to 10 mm. long, surrounded by white silky hairs; palea 3-4 mm. long; anthers 1.5-2 mm. long.

[Two other widely planted large ornamental grasses in the tribe *Arundineæ* are European *Arundo donax* L. (Giant or Danubian Reed) and South American *Cortaderia selloana* (Schult.) Aschers. & Graebn. (Pampas Grass). Both flourish near water and often persist in old plantations and gardens in Victoria, but they do not spread spontaneously and can hardly be called naturalized.]

Tribe PAPPOPHOREÆ

135. ENNEAPOGON Desv. ex Pal. Beauv. (1812)

Panicle *dense* and spike-like, usually dark greyish; glumes *lanceolate*, 4-5 mm. long, 5- to 7-nerved; body of lemma *silky-hairy*, the *distinct* nerves usually forming vertical ribs:

341. *E. nigricans* (R. Br.) Pal. Beauv. *Ess. Agrost.* 82 (1812).

Pappophorum nigricans R. Br. *Prodr. Flor. Nov. Holl.* 185 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 136 (1943); Morris in Ewart, *Flor. Vict.* fig. 64 (1931); Grosse in Turner, *Aust. Grasses* t. opp. 44 (1895), also in *Agric. Gaz. N.S.W.* 2: t. opp. 26 (1891); Bailey, *Ill. Monogr. Grasses Qd 1*: t. [34] (1878)—all except the first (Black) as "*Pappophorum nigricans*".

Vern.: Nigger-heads (Pappus Grass). *Distr.*: Not uncommon on drier grassland of the west, central, north-eastern and far eastern lowlands in Victoria, but virtually absent from coastal areas and infrequent in the far north-western Mallee where it is replaced by *E. avenaceus* (Nhill, Dimboola, Keilor basalt plains near Melbourne, St James, Upper Murray, Snowy & Genoa Rivers, Suggan Buggan, Lower Bendoc—E. Gippsland occurrences in dry open woodland of box eucalypts encircled by mountains); all States except Tas., but not in tropics.

Panicle narrow but *rather loose and interrupted*, greenish or pale grey; glumes *ovate*, 5-8 mm. long, 13- to 21-nerved; body of lemma *glabrous* (except for the long basal hair-tuft), smooth, shining, *nerveless* and \pm globular:

342. *E. avenaceus* (Lindl.) C. E. Hubbard in *Kew Bull.* 1934: 450 (1934).

Pappophorum avenaceum Lindl. in Mitch. *J. Exped. trop. Aust.* 320 (1848).

Illust.: Ross-Craig in Burbidge, *Proc. Linn. Soc., Lond. Sess. 153*: 65 (1941); Wills in Turner, *Agric. Gaz. N.S.W.* 4: t. opp. 414 (1893), as "*Pappophorum avenaceum*".

Vern.: Bottle-washers. *Distr.*: Restricted in Victoria to the Far North-west where scattered on Mallee sand-hill country (Manangatang, Ouyen, Red Cliffs district, extreme north-west); all States except Tas., also Cent. & N. Aust.

Tribe DANTHONIEÆ

136. *SCHISMUS Pal. Beauv. (1812)

343. **S. barbatus* (L.) Thell. in *Bull. Herb. Boiss. sér. 2*, 7: 391 (1907).*Festuca barbata* L. *Demonstr. Plant.* 3 (1753);*S. calycinus* (Loefl., ut *Festuca* sp.) C. Koch in *Linnaea* 21: 372 (1848).

Illust.: Gardner, *Flor. W. Aust. 1^a* (Gramineæ): t. 15 fig. B (1952); Black, *Flor. S. Aust. ed. 2*: fig. 159 (1943); Hitchcock, *J. Dep. Agric. S. Aust. 50*: 400 (1947); Morris in Ewart, *Flor. Vict.* fig. 108 (1931), as "*S. calycinus*"; Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 213 (1955); Phillips, *S. Afr. Grasses* t. 107 (1931); Hitchcock, *Manual Grasses U.S. ed. 2*: fig. 376 (1951); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3135, col. (1934), as "*S. marginatus*"; Coste, *Flor. Franc.* 3: fig. 4092 (1906), as "*S. marginatus*".

Vern.: Arabian Grass (Kelch Grass). *Distr.*: Indigenous to the Mediterranean region, Canary Is, N. Africa, tropical & S. Africa, S. W. & Cent. Asia, W. Pakistan; introduced into U.S.A., N.S.W., S.A., W.A. and Victoria where restricted to light sandy soils in the Mallee, but there abundant and valued as a sheep fodder (Dimboola, Wyperfeld Nat. Park, Kulkyn Nat. Forest and throughout the far North-west to the South Australian border).

Diagn.: Tufted annual, with geniculate ascending culms 2-10" long; leaf-blades 1-2" long (often less), very narrow and involute-setaceous but \pm 1 mm. wide when flattened out, glabrous on outer surface, but sometimes sprinkled with hairs on concealed surface toward junction with sheath the orifice of which bears a tuft of long white cilia; ligule reduced to a microscopic fimbriate rim; panicle rather narrow, loose, usually 1-2" long; spikelets 6- to 8-flowered, 8-10 mm. long; glumes persistent, subequal, 6-8 mm. long, much longer than individual florets, but not quite as long as spikelet, 5- to 7-nerved; lemma 2 mm. long, with short notch at the whitish hyaline apex, very broad and almost rotund when flattened out, conspicuously 9-nerved, softly hairy along the 2 outer nerves; palea equal, obtuse, apically entire; anthers microscopic, 0.2-0.4 mm. long, oblong, pale yellow.

137. DANTHONIA Lam. & DC. (1805)

1. Lateral lobes of lemma *acuminate* (often with setaceous points) and frequently *much shorter than* the central awn 3
Lateral lobes of lemma *acute to \pm obtuse, as long as or longer than* the central awn 2
2. Panicle *narrow*, almost racemose; glumes *> 1 cm. long*; lemma with an upper ring of *long hairs*; palea orbicular in lower part (grass of dry inland areas, the culms *swollen* and almost wholly at base; ligule *glabrous, torn*):

344. *D. bipartita* F. Muell. *Fragm. Phyt. Aust. 1*: 160 (1859).

Illust.: Vickery, *Contr. N.S.W. Herb. 2*: t. 3 fig. 1 (1956); Gardner, *Flor. W. Aust. 1^a* (Gramineæ): t. 14 fig. A, t. 15 fig. A (1952); Black, *Flor. S. Aust. ed. 2*: fig. 133 A (1943); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 114 (1923).

Vern.: Bandicoot Grass. *Distr.*: Grasslands in arid interior of all mainland States; but either very rare (and possibly extinct) in Victoria, or erroneously recorded for the State.

[The only known collections purporting to come from Victoria, except for an impossible "Mt. Hotham" (*leg.* E. E. Pescott, Jan. 1899), are two out of C. Walter's herbarium labelled "Murray River, May 1900" and "Grampians, Dec. 1887"; otherwise, this species does not appear to occur any nearer Victoria than Broken Hill (N.S.W.). Since it is not unusual to find labels hopelessly mixed in Walter's herbarium, these Victorian records are both suspect, and no other collector has located *D. bipartita* south of the Murray during the past half-century.]

—Panicle *spreading*, with loose capillary branches; glumes much <1 cm. (4-6 mm.) long; lemma \pm *glabrous*, except for a fine pubescence toward base; central awn *minute* and very inconspicuous (rare grass of extreme east, the culms neither swollen *nor* woolly at base):

345. *D. paradoxa* R. Br. Prodr. Flor. Nov. Holl. 177 (1810).

Illustr.: Vickery, *Contr. N.S.W. Herb.* 2: t. 3 fig. 3 (1956); Maiden, *Agric. Gaz. N.S.W.* 12: t. opp. 547 (1901).

Vern.: Wiry Wallaby-grass. *Distr.*: Confined in Victoria to forest swamps along Maramingo Ck, 4 miles from the N.S.W. border in far E. Gippsland, thence extending up the coast of New South Wales as far as the Hawkesbury R.

3. Body of lemma almost or quite *glabrous* between the 2 rings or isolated tufts of hairs 11
- Body of lemma \pm *covered with hairs* 4
4. Lemma with *appressed*, uniformly distributed and *undifferentiated hairs*; panicle large and loose (4-14" long); lateral lobes of lemma *not setiform*; palea projecting *well beyond* the sinus; anthers *red* (tussock-forming grass with robust culms to 5 ft. high):

346. *D. pallida* R. Br. Prodr. Flor. Nov. Holl. 177 (1810).

Illustr.: Vickery, *Contr. N.S.W. Herb.* 2: t. 3 fig. 5 (1956); Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 14 fig. F (1952); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 115 (1923); Turner, *Agric. Gaz. N.S.W.* 3: t. opp. 947 (1892), as "*D. robusta*".

Vern.: Silvertop Wallaby-grass (White-topped or Red-anther Wallaby-grass). *Distr.*: Frequent in woodland and forest formations throughout the eastern highlands, ascending to alps and extending through western hills as far as Ararat (but apparently absent from the Grampians); also N.S.W. and W.A. (isolated occurrences near Albany and on the Blackwood R. which require further investigation).

- Lemma with *spreading* and variously *differentiated hairs* (longer above or disposed in rings) 5
5. Hairs *gradually elongating* from base of lemma toward the longer upper series or, if ever suddenly longer, then central awn *only slightly exceeding* lateral lobes 7
 - Hairs uniform below, but an upper series of *conspicuously longer hairs* present; central awn *far exceeding* lateral lobes of lemma 6
 6. Foliage *very long, lax* and *flexuose*; lateral lobes of lemma with long filiform tips (nodes of culms up to 7):

347. *D. longifolia* R. Br. *Prodr. Flor. Nov. Holl.* 176 (1810).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 4 fig. 16 (1956); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 113 (1923).

Vern.: Long-leaf Wallaby-grass. *Distr.*: Scattered through more open forest country of East Gippsland ranges (Howe Range, Wulgulmerang, Tambo R.), with a single isolated record for Oakleigh; also N.S.W., south-east Qd, Tas. (where rare).

—Foliage *not* as above; lateral lobes with short points (nodes rarely exceeding 3):

348. *D. semiannularis* (Labill.) R. Br. *Prodr. Flor. Nov. Holl.* 177 (1810).

Arundo semiannularis Labill. *Nov. Holl. Plant. Specim.* 1: 26, t. 33 (1805).

Illust.: Labillardière (*l.c.*); Vickery, *Contr. N.S.W. Herb.* 2: t. 4 fig. 15 (1956).

Vern.: Wallaby-grass. *Distr.*: Scattered along coast and forested hills in eastern portion of Victoria (Orbost, Wulgulmerang, Yarra Junction, Boronia), with an isolated occurrence as far west as Creswick, but perhaps overlooked owing to confusion with other species; N.S.W., S.A., Tas. (where common), N.Z.

7. Panicle typically *loose* and large (4-7" long); palea projecting *far beyond* the sinus; (leaves long, up to 1 ft.; culms robust, 2-4 ft. high):

349. *D. induta* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 298 (1950).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 4 fig. 13 (1956).

Vern.: Wallaby-grass. *Distr.*: Occasional in rather disjunct hilly localities (Suggan Buggan near Upper Snowy R., Mt. Loch, Keilor, Ballarat, St. Arnaud, Grampians), but probably more widespread; N.S.W., Qd (south-east).

—Panicle usually *dense*; palea *not* or only slightly exceeding the sinus 8

8. Culms usually >18" high; central awn of lemma much *longer than* the lateral lobes or, if otherwise, then the leaves *not* filiform (usually glabrous or at most scaberulous) 10

Culms <18" high (usually <12"); leaves inrolled-filiform; central awn *not* or only slightly longer than the lateral lobes 9

9. Leaves *hairy*; upper ring of hairs on lemma much *shorter than* lateral lobes which are 2-4 times as long as body of lemma:

350. *D. geniculata* J. M. Black in *Trans. roy. Soc. S. Aust.* 53: 261 (1929).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 4 fig. 9 (1956); Black, *Flor. S. Aust.* ed. 2: fig. 133 B (1943).

Vern.: Knead Wallaby-grass. *Distr.*: Frequent in sandy and usually near-coastal localities of southern and western Victoria (Tooradin, Mornington Peninsula, Port Phillip generally, Dandenong, Bellarine Peninsula, Brisbane Range, Gisborne, Creswick, Hawkesdale, Grampians), but apparently not in Gippsland; also S.A.

—Leaves *glabrous* or almost so; upper ring of hairs *as long as* the lateral lobes which are \pm *equal* to length of lemma-body (panicle very congested, *almost ovoid*):

351. *D. carphoides* F. Muell. ex Benth. *Flor. aust.* 7: 592 (1878).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 3 fig. 8 (1956); Black, *Flor. S. Aust.* ed. 2: fig. 133 c (1943); Grosse in Turner, *Aust. Grasses* t. opp. 18 (1895).

Vern.: Short Wallaby-grass. *Distr.*: Grassland plains, savannah and, more rarely, light woodland in northern and western Victoria (Wimmera, Stawell, St. Arnaud, Ravenswood, Chewton Gunbower, Echuca, Nathalia), extending to the basaltic grassland immediately north of Melbourne (Gisborne, Preston); N.S.W., S.A., Tas. (near Launceston).

[The var. *angustior* J. W. Vickery in *Contr. N.S.W. Herb.* 2: 279 (1956) is distinguished by its 2- to 3-flowered spikelets with comparatively narrower glumes, lemma and palea (the palea broadest toward middle, *not* above); it is recorded for Preston, Vic.—presumably on basaltic grassland—and extends also to Tasmania and South Australia.]

10. Palea broadly obovate, obtuse, *not* or only slightly protruding above sinus; lemma-body 4-6 mm. long, the lateral lobes (5-7 mm.) acuminate but *scarcely awned*:352. *D. richardsonii* A. B. Cashmore in *Bull. Coun. sci. industr. Res. Aust.* 69: 22 (1932).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 4 fig. 11 (1956).

Vern.: Wallaby-grass. *Distr.*: Scattered and infrequent on grassland or savannah plains, and known for certain only in the Wimmera (near Horsham), Springhurst, Corio and Sydenham districts; N.S.W., S.A., Qd (near Marshall).

—Palea *lanceolate to fusiform, acutish*, manifestly *exceeding the sinus*; lemma-body 3-4 mm. long, the lateral lobes (7-8 mm.) tapering into *awn-like points* 2-3 mm. long:

353. *D. linkii* Kunth *Enum. Plant.* 1: 315 (1833).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 4 fig. 12 (1956).

Vern.: Wallaby-grass. *Distr.*: Not uncommon on heavier soils in grassland and light, dryish forests of western and north-eastern Victoria (Wimmera, Castlemaine district, Drysdale, Keilor basalt plains, Hurst Bridge, Dandenongs, Goulburn Valley generally, Benalla and Beechworth districts); N.S.W., Qd.

[The var. *fulva* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 299 (1950) is distinguished chiefly by the distinctly *brown* awn which is more strongly twisted at the base—for 3-4 mm., in contrast to 1-1.5 mm. for the typical form. This variant is almost co-extensive with more typical *D. linkii* in Victoria (being recorded from the Goulburn Valley, Dandenongs, Keilor basalt plains, and many parts of the west, including Dimboola); it extends to drier inland parts of New South Wales, but is apparently unknown in southern Queensland where the typical form is widespread.]

11. The two rings of hair-tufts on lemma variously *reduced* 19
 Two *complete rings* of hairs present on back of lemma, in addition to the basal callus-tuft (normally 10 tufts in each ring, rarely less as in some forms of *D. caespitosa* and *D. setacea*) 12

12. Lateral lobes of lemma *very broad* at base, with outer membranous margins ending abruptly in a small *triangular auricle*, the reduced flat portions then tapering into short setæ; central awn only slightly exceeding the setæ; lemma-body, broad, shining, 3.5-4 mm. long, the hair-tufts of upper ring 5-6 mm. long; panicle short, compact, ovoid ($\pm 4 \times 2.5$ cm.), with rather few spikelets (foliage hairy):

354. *D. auriculata* J. M. Black in *Trans. roy. Soc. S. Aust.* 53: 261 (1929).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 6 fig. 26 (1956); Black, *Flor. S. Aust.* ed. 2: fig. 133 E (1943).

Vern.: Lobed Wallaby-grass. *Distr.*: Not uncommon on heavier soils of open plains and lightly forested slopes in western and north-eastern Victoria (Wimmera, Castlemaine district, Toolern Vale, Keilor basalt plains, Strathbogie Range, Gobur, Goulburn Valley generally, Peechelba); N.S.W., S.A.

—Lateral lobes of lemma *without auricles*

13

13. Body of lemma *golden-brown* and shining at maturity; palea broadly fusiform, manifestly *exceeding* the sinus (by ± 2 mm.); lower panicle-branches up to 3" long, *reflexing* at maturity; leaves glabrous, to 8" long, with \pm *obtuse* apices (lowland grass of plains and drier open country):

355. *D. duttoniana* A. B. Cashmore in *Bull. Coun. sci. industr. Res. Aust.* 69: 22, t. 1 (1932).

Illust.: Cashmore (*l.c.*); Vickery, *Contr. N.S.W. Herb.* 2: t. 6 fig. 23 (1956).

Vern.: Brown-back Wallaby-grass. *Distr.*: Chiefly on grassland and savannah plains in north-western (except Mallee), central and north-eastern districts (Wimmera, Wycheproof, Ravenswood, Bendigo, Creswick, Keilor basalt plains, Cohuna-Echuca region, Euroa, Benalla, Tatong, Youanmite); N.S.W., S.A. (apparently rare).

—Body of lemma *remaining pale*; lower panicle-branches *not* reflexing; leaf tips *not* obtuse

14

14. Palea often broad, *not* or only slightly exceeding the sinus and *remote* from setæ of the lemma-lobes

16

Palea *narrow*, *much* exceeding the sinus and approaching the setiform portion of lemma-lobes

15

15. Culms <1 ft. high; leaves *thick, rigid*, with \pm *pungent* apices; panicle *congested*, almost capitate, 1-2" long; body of lemma <4 mm. long; setæ about *as long as* flat portion of lobes (alpine grass of rocky places):

356. *D. alpicola* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 297 (1950).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 5 fig. 21 (1956).

Vern.: Crag Wallaby-grass. *Distr.*: Crevices and ledges of rock (often granitic), on peaks at 5-7000 ft., in woodland of *Eucalyptus pauciflora* var. *alpina* and more exposed alpine herbfield (Cobboras, Bogong High Plains, Mts. Hotham, Featherstop, Bogong, Buffalo & Buller, The Viking in Barry Mtns.); also N.S.W. (Kosciusko plateau).

—Culms 2-4 ft. high; leaves neither thick, rigid *nor* pungent-pointed; panicle *open and loose*, 3-6" long; body of lemma 4-5 mm. long; palea 7-8 mm.; setæ much *shorter than* flat portion of lobes (lowland to subalpine grass):

357. *D. procera* J. W. Vickery in *Contr. N.S.W. Herb.* 2: 306, t. 6, fig. 24 (1956).

Illust.: Vickery (*l.c.*).

Vern.: Tall Wallaby-grass. *Distr.*: On savannah woodland and rare, being known only from Tylden near Woodend and from about 10 miles S.W. of Ballarat (along Hamilton road); also Tas. (south) and doubtfully from near Mt. Kosciuszko, N.S.W.

16. Hair-tufts of upper ring *not exceeding* twisted part of central awn, usually terminating far below setiform part of lobes; lemma-body either <3.5 mm. *or* >4 mm. long; palea rather *narrow*, \pm membranous 18

Hair-tufts of upper ring *exceeding* twisted part of central awn and almost reaching setiform part of lobes (if otherwise, then palea very *broad and firm* in texture); lemma body 3.5-4 mm. long; palea obtuse, obovate to broadly oblong 17

17. Panicle <3" long, typically short, broad and contracted; setæ about *as long as* flat portion of lemma-lobes; central awn 13-15 mm. long; anthers yellow to *pale* orange-yellow, 1.5-2 mm. long:

358. *D. eriantha* Lindl. in *Mitch. Three Exped. E. Aust.* 2: 304 (1838).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 6 fig. 25 (1956).

Vern.: Wallaby-grass. *Distr.*: Almost throughout Victoria, except in the far North-west, and often co-extensive with *D. caespitosa* and *D. setacea* with which it may hybridize; N.S.W., S.A.

—Panicle >3" long, typically narrow and loose; setæ much *shorter than* flat portion of lemma-lobes; central awn 9-12 mm. long; anthers *dark* orange-yellow, 1-1.5 mm. long (leaf-blades up to 8" long, 1-3 mm. wide and flat at least in the lower part):

359. *D. purpurascens* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 301 (1950).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 5 fig. 18 (1956).

Vern.: Wallaby-grass. *Distr.*: Uncommon, in a few disjunct localities of eastern Victoria (Bairnsdale, Heyfield, Mt. Buffalo, Studley Park near Melbourne), with isolated occurrences at Ararat and Mitre Rock; all States except W.A., but localized in S.A. (Mt. Lofty) and Qd (Stanthorpe-Wallangarra district).

18. Body of lemma 2-3 mm. long; palea 2.5 mm. long, obtuse (spikelets usually with a silver-dappled appearance; awns and setæ extremely slender, often purplish):

360. *D. setacea* R. Br. *Prodr. Flor. Nov. Holl.* 177 (1810).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 5 fig. 19 (1956); Fitch in Hooker f., *Flor. Tasm.* 2: t. 161 B, col. (1859), as "*D. subulata*".

Vern.: Bristly Wallaby-grass (Mulga Wallaby-grass). *Distr.*: Abundant over a large part of Victoria, favouring sandy soils, but avoiding basalt plains, mountain-forests and alps, and apparently absent from far north-western, far north-eastern and far eastern districts; all States except Qd.

—Body of lemma 4-6 mm. long (rarely less); palea 4.5-5 mm. long, drawn out into a narrow bifid membranous tip (foliage and panicle highly variable, but spikelets hardly dappled):

361. *D. caespitosa* Gaudich. in Freyc. *Voy. aut. Monde (Bot.)* 408 (1829).

D. semiannularis sens. Morris in Ewart *Flor. Vict.* 196 (1931), atque auctt. Aust. plur., non (Labill.) R. Br. (1810).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 5 fig. 22 (1956); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 14 fig. c (1952); Black, *Flor. S. Aust.* ed. 2: fig. 133 D (1943); Grosse in Turner, *Aust. Grasses* t. opp. 19 (1895); Buchanan, *Indig. Grasses N.Z.* t. 34 (1879)—all except the first as "*D. semiannularis*".

Vern.: Common Wallaby-grass. *Distr.*: Abundant almost throughout Victoria, but apparently absent from Mallee sandhill country, the alps and eastern highlands (where it is replaced by the closely related *D. eriantha*); all States except Qd, naturalized in California.

19. Upper ring of hair-tufts *complete*, the hairs *long* and almost reaching setiform part of lemma-lobes; lower ring usually consisting of marginal tufts only; lateral lobes of lemma usually with broad hyaline margins; palea *exceeding* the sinus, often 5 mm. long (spikelets *few*, often only about 6):

362. *D. laevis* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 299 (1950).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 6 fig. 27 (1956).

Vern.: Wallaby-grass. *Distr.*: Scattered through eastern Victoria (Cobboras Mts., Wulgulmerang, Mt. Hotham, Alexandra, Silvan, Yarra Junction, Cranbourne district), with isolated records for Gisborne and Hawkesdale but probably of much wider range in west of State; N.S.W., S.A., Tas.

—Upper ring of hairs *reduced to marginal tufts*, with or without 2-4 intermediate tufts, the hairs all terminating *far below* the setæ of lemma-lobes; lower ring often variously suppressed 20

20. Lemma with \pm *dilated* lobes which *contract suddenly* into the setæ; callus stipe-like, *elongated*, usually 1-2 mm. long (inflorescence typically a slender raceme, with uppermost florets often projecting well beyond the 2 glumes):

363. *D. racemosa* R. Br. *Prodr. Flor. Nov. Holl.* 177 (1810).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 7 fig. 30 (1956); Black, *Flor. S. Aust.* ed. 2: fig. 133 F (1943), as "*D. penicillata*"; Buchanan, *Indig. Grasses N.Z.* t. 33¹ B (1879), as "*D. pilosa* var. *racemosa*".

Vern.: Wallaby-grass. *Distr.*: Frequent in central and north-eastern Victoria, with scattered occurrences in East Gippsland, and not collected west of Bendigo-Castlemaine district; all States (but apparently only Bridgetown in W.A.), N.Z.

—Lemma-lobes *tapering gradually* into the setæ (or awnless points); callus indistinct and *short*, rarely > 1 mm. (inflorescence variable, dense or etiolated, but the florets *never* manifestly protruding beyond glumes)

21. Foliage and short culms (the latter never > 1 ft. high) *rigid, glabrous*; awns *not or only slightly* exceeding the 2 glumes; hair-tufts of lemma *marginal only* and much reduced (alpine grasses) 21
 Foliage *lax*, \pm *hairy*; awns manifestly *exserted* beyond glumes; intermediate hair-tufts usually present in the upper series (lowland or montane forest grasses) 23
 22. Inflorescence typically a *short, contracted* rather stiff panicle < 3" long, the spikelets *crowded*; palea broadly *oblanceolate*, only slightly exceeding the sinus: 22

364. *D. pilosa* R. Br. *Prodr. Flor. Nov. Holl.* 177 (1810).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 7 fig. 28 (1956); Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 14 fig. D (1952); Buchanan, *Indig. Grasses N.Z.* t. 33, 33^a A (1879).

Vern.: Velvet Wallaby-grass (Purple-awned Wallaby-grass). *Dist.*: Frequent almost throughout Victoria, except in the Mallee, and often co-extensive with both *D. racemosa* and *D. penicillata*; all States (but apparently only Stanthorpe in Qd), N.Z., naturalized in California.

[The var. *paleacea* J. W. Vickery in *Contr. N.S.W. Herb.* 2: 313 (1956) is more robust in all its parts than the typical form; culms are up to 3 ft. high, leaves more than 2 mm. wide, glumes 13-20 mm. long (cf. 9-13 mm. in typical *D. pilosa*) with broad chaffy margins, and the strong awn exceeding lateral lobes of lemma by up to 1 cm. It ranges from S. W. Western Australia to the Mt. Lofty Range in South Australia and the Upper Murray in Victoria.]

—Inflorescence a *slender*, often weak, *raceme* 2-6" long with the spikelets sometimes remote; palea *linear-lanceolate*, much exceeding the sinus (grass typically of cool shaded forest-land):

365. *D. penicillata* (Labill.) Pal. Beauv. *Ess. Agrost.* 92 (1812).

Arundo penicillata Labill. *Nov. Holl. Plant. Specim.* 1: 26, t. 34 (1805).

Illust.: Labillardière (*l.c.*); Vickery, *Contr. N.S.W. Herb.* 2: t. 7 fig. 29 (1956).

Vern.: Slender Wallaby-grass. *Dist.*: Throughout the cooler parts of Victoria and shade-tolerant in mountain-forests, absent from all plains and the Mallee N.S.W., Tas.

23. Panicle 1-3" long, only shortly exserted; awns \pm 8 mm. long, *slightly protruding* beyond glumes; whole lemma > 5 mm. long, the lateral lobes bearing short but *prominent setæ*:

366. *D. nudiflora* P. F. Morris in *Vict. Nat.* 52: 111, t. 10 (1935).

D. pauciflora sens. Morris in Ewart *Flor. Vict.* 195 (1931) pro parte, non R. Br. (1810).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 7 fig. 31 (1956); Morris (*l.c.*).

Vern.: Alpine Wallaby-grass. *Distr.*: Confined to elevations above 4000 ft., but widespread in subalpine woodland, alpine grassland, alpine herbfield and fen formations (Cobboras, Bogong High Plains, Mts. Fainter, Feathertop, Hot-ham, Buffalo, Buller & Federation near Lake Mtn., Baw Baws, Nunniong Plateau); N.S.W. (Kosciusko region); Tas.

—Panicle \pm 1" long, much exserted, often dark purplish; awns *minute*, <3 mm. long, *not* protruding beyond glumes; whole lemma <5 mm. long, the lateral lobes acute to acuminate (but *awnless*) and *shorter* than the body:

367. *D. nivicola* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 300 (1950).

D. pauciflora sens. Morris in Ewart *Flor. Vict.* 195 (1931) *pro parte*, *non* R. Br. (1810).

Illust.: Vickery, *Contr. N.S.W. Herb.* 2: t. 7 fig. 32 (1956); Chambers in Maiden, *Agric. Gaz. N.S.W.* 12: t. opp. 477 (1901), as "*D. pauciflora*".

Vern.: Snow Wallaby-grass. *Distr.*: Scattered through alpine grassland, alpine herbfield and fen formations at 5-6500 ft. (Bogong High Plains, Mts. Feathertop & Buffalo, Baw Baws); N.S.W. (Kosciusko region), Tas.

138. TRIODIA R. Br. (1810)

Glumes and lemmas stiff, \pm *indurate*, *never hyaline*; lemma with *evenly rounded* ribless margins (highly xeromorphic perennial grass, forming dense, rounded spiny tussocks, to 6 ft. high when in flower, sometimes annular through death of central part of "cushion"; leaf-blades divaricate, involute-terete, 3-8" long, hard, rigid, pungently pointed):

368. *T. irritans* R. Br. *Prodr. Flor. Nov. Holl.* 182 (1810).

Illust.: Burbidge, *Aust. J. Bot.* 1: 170 fig. 15 a & b (1953); Black, *Flor. S. Aust.* ed. 2: fig. 140 (1943); Morris in Ewart, *Flor. Vict.* fig. 60 (1931).

Vern.: Porcupine Grass. *Distr.*: Frequent on Mallee sand-hills in Little and Big Deserts, Wyperfeld Nat. Park, extending through Mallee country at least as far east as Lake Tyrrell, with isolated southern occurrences on Lower Glenelg R. and near Wannon Falls; N.S.W., Qd (Darling Downs), S.A., Cent. Aust.

[Most Victorian material is referable to the var. *compacta* N. T. Burbidge in *Aust. J. Bot.* 1: 169, fig. 15 a (1953), having 8-12 broad awnless lemmas that remain *compactly* imbricate in each plump spikelet; this form extends through southern South Australia (at least as far west as the Nuyts Archipelago near Ceduna). The var. *laxispicata* N. T. Burbidge (*l.c.* 171) is distinguished by its 4- to 7-flowered spikelets which become *loose* and open widely at maturity; it is known from along the Murray near Tooleybuc in New South Wales (extending north to the Darling Downs, Qd), and a collection in Melbourne Herbarium from Lake Coorong, Vic., seems to accord well with this form. Typical *T. irritans*, from the far north of South Australia and Eyre Peninsula, has *awned* lemmas and does not occur in Victoria. The description under *T. irritans* in Ewart's *Flor. Vict.* 140 (1931) embraces also the recently described *T. scariosa* (*seq. q.v.*).]

Glumes and lemmas thinly scarious or almost membranous and \pm *hyaline*; lemma usually narrow-lanceolate, with the 2 lateral nerves forming *ridges* near the margins, so that it appears to be 3-ribbed (with *dorsally flattened apex*):

369. *T. scariosa* N. T. Burbidge in *Aust. J. Bot.* 1: 173, fig. 16 b-d (1953).

Illust.: Burbidge (*l.c.*); Gardner, *Flor. W. Aust.* 1¹ (Gram.); t. 21 fig. A (1952), as "*T. irritans*"; *Wild Life* 3: 446 (1941), as "*Triodia*"; Beadle, *Veg. Pastures West. N.S.W.* fig. 104 (1948), as "*T. irritans*".

Vern.: Porcupine Grass. *Distr.*: Frequent on mallee sand-hills of the Far North-west Mallee (including Kulkyne Nat. Forest) and ranging south-easterly at least to Nandaly district; N.S.W., S.A., W.A. (Zanthus-Kalgoorlie region to Meekatharra).

139. **SIEGLINGIA* Bernh. (1800)

370. **S. decumbens* (L.) Bernh. *Syst. Verzeichn. Pfl.* 20, 44 (1800).

Festuca decumbens L. *Spec. Plant.* 1: 75 (1753).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 326 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 415 (1951); Gleason, *New Britton & Brown Ill. Flor. N.E. United States & Canada* 1: 158 (1952); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1253 (1931), as "*Triodia decumbens*"; Poinsoy in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 12: fig. 3166, col. (1934), as "*Danthonia decumbens*"; Coste, *Flor. Franc.* 3: fig. 4085 (1906), as "*Danthonia decumbens*"; Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 32 fig. 1, col. (1907); Reichenbach, *Icon. Flor. germ.* 1: fig. 1572 (1834), as "*Triodia decumbens*".

Vern.: Heath Grass. *Distr.*: Peaty moorland soils and poorer hill grassland almost throughout Europe, indigenous also to S.W. Asia, N.W. Africa, Azores, Madeira; introduced into Newfoundland, California, N.Z., and Victoria where now scattered in a few southern districts (Tap Tap Plains and Toora in S. Gippsland, Mt. Evelyn and Dandenongs near Melbourne).

Diagn.: Tufted perennial 4-12" high (rarely to 2 ft.); leaf-blades 2-10" long, 2-4 mm. wide, flat or inrolled, pointed or \pm obtuse at apex, glabrous to sparsely hairy; ligule a short fringe of dense hairs; culms erect or \pm procumbent, stiff; panicle 1-2" long, narrow, rather compact, few-flowered (3-12 spikelets), the rough branches short and erect; spikelet 4- to 6-flowered, 6-12 mm. long, plump, elliptic-oblong, often purplish; glumes persistent, equal, 6-12 mm. long, rounded, ovate-lanceolate, pointed or bluntish, 3- to 5-nerved, with smooth thin and hyaline sides; lemmas closely overlapping 5-7 mm. long, broadly elliptic, minutely 3-toothed at apex, 7- to 9-nerved, \pm short-haired along lower margins and bearded at base, becoming tough and rigid; palea equal, with 2 pubescent keels; anthers minute, 0.2-0.4 mm. long.

140. **PENTASCHISTIS* (Nees) Stapf (1899)

371. **P. airoides* (Nees) Stapf in *Flor. capens.* 7: 511 (1899).

Pentameris airoides Nees in *Sem. Hort. Bot. Vratisl.* (1834).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 13 fig. B (1952); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 242 (1955); Dietrich, *Flor. universal.* Abt 1: t. 886, col. (1852-55), as "*Danthonia airoides*".

Vern.: False Hair-grass. *Distr.*: Indigenous to S. Africa; introduced into W.A., S.A., N.S.W., and Victoria where occasional in dry open and sandy places in the Mallee (at Dimboola, Wyperfeld Nat. Park and around Mildura), but perhaps overlooked on account of its superficial resemblance to the very common *Aira caryophylllea*.

Diagn.: Small, delicate annual 2-6" (rarely to 12") high; leaf-blades 1-4 cm. long 1-3 mm. wide, flat, finely pointed, \pm smooth on upper surface but villous beneath, the margins usually ciliate-glandular and sheaths often with tubercle-

based, bristly hairs; panicle 1-3" long and broad, becoming loose, often purplish, the capillary branches minutely swollen or knotted at their points of division; spikelets (including awns) 6-8 mm. long, with 2 fertile flowers; glumes subequal, 3-4 mm. long, persistent, \pm hyaline, 1-nerved, acuminate but becoming torn at apex; lemma 2-3 mm. long (sometimes less), narrow-elliptic, glabrous, 5- to 7-nerved, 2-lobed, with twisted geniculate awn (5-6 mm. long) arising from notch and 2 fine bristle-like secondary awns (1.5-2.5 mm. long) surmounting the 2 apical lobes; anthers oblong, microscopic, 0.2-0.3 mm. long.

[Also now assigned to the tribe *Danthonieæ* is the Eurasian coarse perennial grass *Molinia cærulea* (L.) Moench (Purple Moor-grass), which Morris in Ewart's *Flor. Vict.* 143 (1931) admitted as naturalized in N.E. Victoria. The sole basis for the record would seem to be a dubious specimen from C. Walter's herbarium, labelled "Goulburn, 1902"; otherwise the species is unknown from anywhere else in Australia.]

Tribe STIPEÆ

141. ARISTIDA L. (1753)

Culms up to 1 ft. high; panicle *narrow, loose*, 2-4" long; mature awns *articulate* on lemma, twisting around each other to form a *spurious "column"* 1-3 cm. long, the *free parts* of the 3 awns 3-6 cm. long (desert grass, with scabrid filiform leaf-blades \pm 0.5 mm. wide):

372. *A. contorta* F. Muell. in *Trans. Vict. Inst.* 44 (1855).

A. arenaria Gaudich. *Voy. aut. Monde (Bot.)* 407 (1829), *non* Trin. (1826).

Illust.: Gardner, *Flor. W. Aust.* 1st (Gramineæ): t. 49 fig. c (1952); Chambers in Maiden, *Agric. Gaz. N.S.W.* 10: t. opp. 1258 (1899); Henrard, *Meded. Rijks-Herb.* 54: 39 (1926), also 58 A: t. 103 (1932); Domin, *Bibl. bot., Stuttgart* 20 (Heft 853): t. 13 fig. 6-7 (1915)—all as "*A. arenaria*".

Vern.: Sand Wire-grass (Sand Spear-grass, Mulga Grass). *Distr.*: In Victoria confined to arid calcareous and sandy terrain in the Far North-west (e.g. at Boundary Point) where apparently rare, a collection labelled "Portland" in Melbourne Herbarium being of dubious origin; dry inland tracts of all States except Tas.; also Cent. Aust.

—Culms up to 1 ft. high; panicle *dense, broad* and brush-like, 2-4" long; mature awns neither *articulate* *nor* forming a marked column, 3-9 cm. long (grass of Mallee and northern dryish plains; leaf-blades almost glabrous, \pm involute but filiform only above, 1-2 mm. wide):

373. *A. behriana* F. Muell. in *Trans. Vict. Inst.* 44 (1855).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 102 (1943); Morris in Ewart, *Flor. Vict.* fig. 93 (1931); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 112 (1923); Chambers in Maiden, *Agric. Gaz. N.S.W.* 11: t. opp. 201 (1900); Henrard, *Meded. Rijks-Herb.* 54: 51 (1926), also 58 A: t. 126 (1932); Domin, *Bibl. bot., Stuttgart* 20 (Heft 854): t. 14 fig. 13-14 (1915).

Vern.: Brush Wire-grass (Brush Spear-grass). *Distr.*: Scattered through pastures, savannah or drier open woodlands of western and northern Victoria, usually on loamy soils, but nowhere common (Dimboola, Nhill, Majorca, Nathalia, Heathcote, Cornishtown, Wangaratta); S.A., N.S.W., Qd.

—Culms 1-3 ft. high, tough rigid and *cane-like*; panicle *very narrow* but loose, 3-6 long; mature awns not articulate on lemma, ± 1 cm. long (grass of \pm rocky terrain chiefly in east and north-east of State):

374. *A. ramosa* R. Br. *Prodr. Flor. Nov. Holl.* 173 (1810).

Illust.: Henrard, *Meded. Rijks-Herb.* 54B: 495 (1928), also 58A: t. 125 (1932).

Vern.: Cane Wire-grass (Purple Wire-grass, Cane Spear-grass). *Distr.*: Occasional throughout northern and eastern Victoria, on poorer pastures of sand-hills or dry stony ridges below 1500 ft. where sometimes locally frequent (e.g. Borung, Upper & Lower Murray R., Longwood, Locksley, Benalla, Moyhu, Bright, Swift's Ck, Suggan Buggan, Upper Snowy R., Deddick R.); N.S.W., Qd, Cent. Aust.

[The record of *A. calycina* R. Br. in Ewart's *Flor. Vict.* 175 (1931) was based upon erroneously determined materials of *A. ramosa* from the Wimmera region ("Borung—on sand ridges").]

142. ANISOPOGON R. Br. (1810)

375. *A. avenaceus* R. Br. *Prodr. Flor. Nov. Holl.* 176 (1810).

Illust.: Heyward in Ewart, *Flor. Vict.* fig. 110 (1931); Wills in Maiden, *Agric. Gaz. N.S.W.* 7: t. opp. 561 (1896), also in *Manual Grasses N.S.W.* t. opp. 132 (1898); Delile in Kunth, *Révis. Gram.* 1: t. 62, col. (1830).

Vern.: Oat Spear-grass. *Distr.*: Restricted in Victoria to eastern parts of Gippsland, where locally frequent on flat sandy ground of open forests or heaths near the coast (Stradbroke district, Providence Ponds, Prince's Highway 8 miles east of Brodribb R., Sperm Whale Head, Lower Cann R., Wingan Inlet); N.S.W., Qd.

Diagn.: Stout, tufted or shortly rhizomic perennial with glabrous cane-like culms 2-4 ft. high; leaf-blades 6-16" long, 3-6 mm. wide when flattened out, usually \pm involute, finely and subulately acuminate, the upper (or inner) surface prominently ribbed with about 15 scaberulous nerves, the uppermost leaves passing into much shorter rigid bracts along culm; ligule a short fimbriate collar to 0.5 mm. high; panicle large, loose, sometimes long, relatively few-flowered, the spikelets dangling from slender pedicels; spikelet 1-flowered, very large; glumes 1.5-2" long, the lower slightly shorter, 3-5 mm. wide, linear, \pm 9-nerved, herbaceous, finally chaffy and waving in breeze (like pennants from one side of culm); body of lemma 10-14 mm. long, shortly hairy, terminating in 3 rigid awns; central awn very stout and hard, \pm scabrid, twisted and sharply bent, the \pm shining column 1-1.5" long and bristle part 1.5-2" long; lateral awns much finer, subequal, ± 1 " long, shining, hardly twisted; palea narrow, 10-14 mm. long, stiffly pointed; lodicules long and conspicuous; anthers 8-11 mm. long, linear, yellow, the loculi with pointed and finally divergent apices.

143. STIPA L. (1753)

1. Leaf-blade *rudimentary*, scale-like, <1" long; culms tough and wiry, the long filiform peduncles bearing 1-3 large spikelets (lemma hairy, 15-20 mm. long, with 2 hyaline erect and appressed lobes ± 3 mm. long at summit; awn massive, rigid, 6-8 cm. long, the column 4-5 cm.);

376. *S. muelleri* Tate in *Trans. roy. Soc. S. Aust.* 7: 70 (1885).*Illustr.*: Hughes, *Kew Bull.* 1921: 13 fig. 3 (1921).*Vern.*: Wiry Spear-grass. *Distr.*: Locally frequent in heathlands and stunted open woodlands of south-western Victoria (Grampians, Black Range, Lower Glenelg R., Poolaigelo), with an isolated distribution in the Macclesfield-Gembrook-Tonimbuk district (where it is indicative of poor infertile soils and known as "bayonet grass"); also in the Mt. Lofty Ranges, S.A.

—Leaf-blade *well developed*, >1" long; culms not tough and wiry, bearing panicles of many more than 3 spikelets 2

2. Panicle branches and pedicels glabrous, scabrid or pubescent (but *not* plumose), the panicle remaining on culm after maturity; palea at least $\frac{1}{2}$ the length of lemma, and usually subequal 4

Panicle branches and pedicels \pm *plumose*, the very loose panicle breaking away from culm at maturity; palea only about $\frac{1}{4}$ the length of lemma (ligule hyaline, 3-4 mm. long) 3

3. Culms *glabrous*, often branched, slender but usually cane-like; panicle branches *plumose* with long sometimes pinkish hairs; glumes 8-12 mm. long, purplish, with *scattered hairs*:

377. *S. elegantissima* Labill. *Nov. Holl. Plant. Specim.* 1: 23, t. 29 (1805).*Illustr.*: Labillardière (*l.c.*); Gardner, *Flor. W. Aust.* 1^a (Gramineæ): t. 50 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 106 (1943); Hughes, *Kew Bull.* 1921: 13 fig. 1 (1921).*Vern.*: Feather Spear-grass. *Distr.*: Widespread and frequent throughout the Victorian Mallee, on dry sandy ground (e.g. Far North-west to Boundary Point, Wyperfeld Nat. Park, Dimboola, Big & Little Deserts), with isolated occurrences near Melbourne (Djerriwarrah Ck beyond Melton, Studley Park, Oliver's Hill at Frankston) and at Nathalia in the Goulburn Valley; all States except Tas.

—Culms *hairy*; panicle branches *shortly plumose*; glumes \pm 8 mm. long, purplish toward apex, *glabrous* or almost so:

378. *S. tuckeri* F. Muell. *Fragm. Phyt. Aust.* 11: 128 (1881).*Illustr.*: Hughes, *Kew Bull.* 1921: 13 fig. 2 (1921).*Vern.*: Spear-grass. *Distr.*: Known in Victoria by only two Mallee collections—from Robinvale (June 1961), also Boonoonar salt pans west from Carwarp and Nowingi in the Far North-west (Sept. 1955), but doubtless overlooked; also western N.S.W. and S.A. (between Baratta & Lake Frome).

4. Glumes and lemma distinctly longer than 6 mm. and 4 mm. respectively, the latter *never coronate* (or, if slightly so, then fulvous-hairy) 5

—Glumes \pm 5 mm. long; lemma 3-4 mm. long (palea \pm half this length); awn \pm 3 cm. long (cane-like grass to 3 ft. high, with dense many-flowered inflorescence):

379. *S. breviglumis* J. M. Black in *Trans. roy. Soc. S. Aust.* 65: 333 (1941).*Illustr.*: Nil.

Vern.: Cane Spear-grass. *Distr.*: Rare and localized in Victoria where restricted to a few gorges and rocky stream banks in the west (Coimadai near Bacchus Marsh, Lerderderg Gorge, Brisbane Range, St. Arnaud); S.A. (Lyndoch in Mt. Lofty Range, Mt. Brown), W.A. (Madura on Hampton Range scarp west from Eucla).

—Glumes \pm 10 mm. long; lemma 6-8 mm. long, white-hairy at base, crowned at the pale glabrous apex by a distinct, often purplish *ciliate or denticulate collar* up to 1 mm. high; awn twice-bent, 4-5 cm. long (inflorescence loose and rather few-flowered):

380. **S. neesiana* Trin. & Rupr. in *Mém. Acad. Sci. St. Pétersb.* sér. 6, *Sci. math. phys. & nat.* 7²: Bot. 27 (1842).

Illust.: Cabrera, *Manual Flor. Alrededores B. Aires* fig. 25 J (1953); Herter, *Flor. il. Uruguay I*: fig. 419 (1942).

Vern.: Spear-grass. *Distr.*: Indigenous to temperate S. America; introduced into N.Z., N.S.W., and Victoria where locally frequent on basaltic grassland north from Melbourne (Fairfield, N. Preston, Broadmeadows etc.) and along a railway embankment at N. Brighton.

5. Leaf-blades glabrous, filiform, very long, rush-like and *pungent-pointed*; ligule hyaline, glabrous, to 10 mm. long; lemma 10-15 mm. long, plumose, with 2 small appressed hairy lobes at summit and a twice-bent awn 2.5-4 cm. long (tussock-forming maritime perennial, with narrow panicles and broadish erect hyaline glumes 15-20 mm. long):

381. *S. teretifolia* Steud. *Synops. Plant. glumac. I*: 128 (1854).

Illust.: Hughes, *Kew Bull.* 1921: 13 fig. 5 (1921).

Vern.: Prickly Spear-grass (Coast Spear-grass). *Distr.*: Frequent on coastal bluffs and exposed sea-cliffs of eastern Victoria (Port Phillip, Phillip Id, Wilson Prom., Cape Conran, Ram Head, Mallacoota etc.), less common along the western coast-line; also S.A., Tas., ? W.A.

Leaf-blades not pungent and seldom filiform (if occasionally subpungent or terete, then either hairy or ligule reduced to a ciliate rim); lemma without 2 apical lobes (often caespitose, but never forming large tussocks)

6. Ligule very short, 1 mm. long or less, frequently ciliate or reduced to a ciliate rim; if ever attaining 3 mm., then the inflorescence diffuse and the plump swollen lemmas with short twice-bent awns <4 cm. long [*S. aristiglumis*]

—Ligule prominent, 2.5-12 mm. long, glabrous and non-ciliate (or sometimes with cilia on outer margins only); lemma never simultaneously plump and with twice-bent awn <4 cm. long (panicle \pm loose)

7. Leaf-blades involute, becoming filiform and <4 mm. wide; awn either <5 cm. long or 12-15 cm. (plant caespitose)

Leaf-blades flat, 4-8 mm. wide; awn 6-8 cm. long (plant 2-5 ft. high, strongly rhizomic)

8. Lower glume 12-15 mm. long, its 3 prominent nerves glabrous; bristle of awn distinctly *flattened*, with a prominent mid-nerve (culms often branched, tough and \pm cane-like):

382. *S. platychæta* D. K. Hughes in *Kew Bull.* 1921: 16, fig. 17-17 A (1921).

Illust.: Hughes, *Kew Bull.* 1921: 17 fig. 17 (1921).

Vern.: Flat-awned Spear-grass. *Distr.*: Restricted in Victoria to Mallee sand-hill country of the Far North-west, but there abundant (from Kulkyn Nat. Forest west to Murrayville and north-west to Boundary Point); N.S.W., S.A., W.A.

—Lower glume 7-10 mm. long, sometimes ciliate on margins, its 3 nerves distinctly scabrid; bristle of awn filiform, *not flattened*; callus of lemma distinct, pungently acute (culms simple, not cane-like):

383. *S. acrociliata* F. M. Reader in *Vict. Nat.* 13: 167 (1897).

Illust.: Hughes, *Kew Bull.* 1922: 19 fig. 1 (1922).

Vern.: Graceful Spear-grass. *Distr.*: Scattered through the western Mallee of Victoria (from Little Desert near Dimboola north to Walpeup and Kulkyn Nat. Forest) but apparently rare; N.S.W., S.A., W.A. (Fraser Range).

9. Annual with *broad* leaf-sheaths (>5 mm. wide), the lower ones *hairy*; ligule 6-12 mm. long; awns capillary, 12-15 cm. long, the column >3 cm.; lower glume usually >18 mm. long:

384. *S. macalpinei* F. M. Reader in *Vict. Nat.* 15: 143 (1899).

S. scelerata Behr ex J. M. Black *Flor. S. Aust.* 65 (1922).

Illust.: Hughes, *Kew Bull.* 1921: 27 fig. 40 (1921), as "*S. lachnocolea*".

Vern.: Annual Spear-grass (Golden Spear-grass, One-year Grass). *Distr.*: Restricted in Victoria to the western Mallee, seldom collected and only abundant after recent scrub-fires (Little Desert, Murrayville—the label "Melbourne" on an old collection in Kew Herbarium is surely erroneous); also S.A., W.A.

—Perennial with *narrow*, totally *glabrous* leaf-sheaths; ligule <6 mm. long; panicle usually rather few-flowered; awns <5 cm. long, \pm twice-bent, the column <3 cm. (usually <2 cm.); lower glume <18 mm. long:

385. *S. setacea* R. Br. *Prodr. Flor. Nov. Holl.* 174 (1810).

Illust.: Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 110 (1923); Wills in Maiden, *Manual Grasses N.S.W.* t. opp. 113 (1898); Fitch in Hooker f., *Flor. Tasm.* 2 t. 157 B, col. (1859); Hughes, *Kew Bull.* 1921: 27 fig. 36 (1921).

Vern.: Corkscrew Grass. *Distr.*: Uncertain so far as Victoria is concerned, owing to previous confusion with other species (chiefly forms of *S. variabilis*), but specimens from the basalt plains immediately to the north of Melbourne have comparable ligules and conform reasonably well to the circumscription of *S. setacea*; N.S.W., Qd, S.A.

10. Awn glabrous or pubescent, never plumosely hairy or, if so (rarely), then the bristle part curved like a sickle and the glumes <10 mm. long [*S. drummondii*]

Awn (at least the column, and often part of bristle also) *conspicuously plumose*, twice-bent and never regularly falcate; glumes acuminate, >12 mm. long and often up to 24 mm. (panicle usually large, dense and stiffly erect) 11

11. Awn shortly *plumose all round*, the hairs seldom extending far along bristle; column part rather stout, usually >2 cm. long; hairs on callus sometimes fulvous (leaves and glumes often becoming shredded and *fibrous* with age):

386. *S. semibarbata* R. Br. *Prodr. Flor. Nov. Holl.* 174 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 109 (1943); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 109 (1923); Hughes, *Kew Bull.* 1921: 23 fig. 26 (1921), also *l.c.* 23 fig. 23 (1921) as "*S. mollis*"; Hubbard in Hutchinson, *Fam. flowering Plant.* 2 (Monocotyledons): 216 (1934), as "*S. mollis*".

Vern.: Fibrous Spear-grass (Barbed Spear-grass). *Distr.*: Widespread and frequent in Victoria (Mallee, grasslands, light sclerophyll forest and coast, but not in the alps), being represented in such far separated districts as Little & Big Deserts, Black Range, Mt. Cole, St. Arnaud, Bendigo, Creswick, Brisbane Range, Tallarook, Melbourne, Bairnsdale, Suggan Buggan; all Australian States.

[The var. *mollis* (R. Br., *ut sp.*) Benth. is more robust, with softly pubescent foliage, and is widespread in Victoria. *S. densiflora* D. K. Hughes, described from "Central Victoria" in *Kew Bull.* 18 (1921), appears to be merely a densely paniculate form of *S. semibarbata* having consistently shorter awns (only 3-4 cm. long).]

—Awn long-plumose *along one side only*, the hairs often extending toward the end of the bristle; column part usually 10-20 mm. long:

387. *S. hemipogon* Benth. *Flor. aust.* 7: 569 (1878).

S. mollis sens. Morris in Ewart *Flor. Vict.* 181 (1931), *non* R. Br. (1810).

Illust.: Hughes, *Kew Bull.* 1921: 23 fig. 21 (1921).

Vern.: Spear-grass. *Distr.*: Widespread and rather frequent almost throughout Victoria (except in the alps), with a similar range to *S. semibarbata* but apparently less common (Kulkyne Nat. Forest, Underbool, Little Desert, Lower Glenelg R., Warracknabeal, Bendigo, Anglesea, Graytown, Dandenongs, Cape Conran, Mallacoota, Genoa R. Gorge); S.A., W.A., ? N.S.W.

[*S. plagiopogon* and *S. indepressa*, both described by J. M. Black in *Trans. roy. Soc. S. Aust.* 65: 334 (1941), seem to differ from *S. hemipogon* only in trifling details and to be unworthy of recognition as distinct species.]

12. Glumes not noticeably bulging, the spikelet narrow or at least not manifestly wider toward the middle 14

Glumes prominently veined in green almost to the apex, *bulging around the swollen lemma* so that each spikelet appears much wider at the middle; panicle loose; awn twice-bent, 3-5 cm. long 13

13. Lemma without any apical tuft of hairs; panicle \pm broad, very open and lax, of oat-like appearance:

388. *S. aristiglumis* F. Muell. in *Trans. Vict. Inst.* 43 (1855).

Illust.: Hughes, *Kew Bull.* 1921: 27 fig. 33 (1921), also *l.c.* 27 fig. 34 (1921) as "*S. fusiformis*".

Vern.: Plump Spear-grass (Bristly Spear-grass). *Distr.*: Scattered through grassland and open drier woodlands of Victoria, chiefly north of the Divide and sometimes locally abundant (Dimboola, Swan Hill, Kerang, Inglewood, Mooroopna, Cornishtown, Suggan Buggan etc.); S.A., N.S.W., Qd. [At Mildura a form of what appears to be this species has less swollen spikelets and longer lower glumes (15-20 mm.) than usual.]

—Lemma with a *conspicuous brush* (2-5 mm. high) of longer hairs at the summit; panicle narrow:

389. *S. blackii* C. E. Hubbard in *Kew Bull.* 1925: 431 (1925).

Illust.: Nil.

Vern.: Crested Spear-grass. *Distr.*: Scattered in grassland and open forests of eastern Victoria, with a preference for damp places (Melbourne, Bairnsdale, Tongio, Limestone Ck, Suggan Buggan), also at Winchelsea and perhaps overlooked in other western districts; N.S.W., S.A., ? W.A.

[It is possible that this taxon may prove to be inseparable specifically from *S. bigeniculata* D. K. Hughes 1922, in which event the latter older name will have to be applied.]

14. Awn gently or sharply *twice-bent*, never curving evenly like a sickle 16
Awn with rather short column (10-15 mm.), the long slender pliant bristle
curved when ripe like a sickle; panicle rather loose (often waving lightly
in the breeze, with one-sided appearance); leaf-blades \pm scabrous or
densely pubescent 15

15. Slender grass, with very loose few-flowered panicle; leaves scabrid with
short stiff hairs, or almost glabrous; nodes glabrous; ligule ciliate; both
glumes acuminate, usually purplish; column of the strongly falcate
awn pubescent or glabrous:

390. *S. variabilis*—D. K. Hughes in *Kew Bull.* 1921: 15, fig. 13-13 A (1921).

S. falcata Hughes *l.c.* 14;

S. incurva Hughes *l.c.* 16.

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 107 (1943); Atkinson, *N.Z. J. Agric.* 36: 202 (1928), as "*S. setacea*"; Buchanan, *Indig. Grasses N.Z.* t. 17^a (1877), as "*S. petriei*"; Hughes, *Kew Bull.* 1921: 17 fig. 13 (1921), also *l.c.* 17 fig. 12 (1921) as "*S. falcata*", & *l.c.* 17 fig. 16 (1921) as "*S. incurva*".

Vern.: Variable Spear-grass. *Distr.*: Very widespread and abundant almost throughout Victoria (except in the alps), frequenting Mallee sand-hills, heathland, grassland and open tracts of drier woodland (from the Far North-west and Lower Glenelg to the Goulburn Valley, Upper Murray and E. Gippsland); all States except Qd (?), and introduced into N.Z. (South Id).

—As for the last, but panicle denser, many-flowered, greenish and shining; bristle of awn gently curving or almost straight (seldom strongly falcate); auricular lobes at summit of leaf-sheath very prominent, 1-2 mm. high, usually with long villose or woolly hairs:

391. *S. nitida* V. S. Summerhayes & C. E. Hubbard in *Kew Bull.* 1927: 80 (1927).

Illust.: Nil.

Vern.: Balcarras Grass. *Distr.*: Restricted in Victoria to the Mallee, but locally common on sand-hills (Red Cliffs to the extreme north-west at Boundary Point, probably also in Big Desert); N.S.W., S.A.

[*Stipa scabra* var. *pallida*, described by F. M. Reader in *Vict. Nat.* 17: 156 (Jan. 1901), is probably conspecific, and *S. nitida* is so close to the polymorphic *S. variabilis* that it may not warrant recognition as a distinct species.]

—Rather stout grass with loose panicle; leaves densely pubescent all over, and silky-villose on the broad sheaths; nodes pubescent; ligule glabrous; lower glume obtusish or torn at apex; column of awn strongly barbellate, with hairs \pm 0.5 mm. long:

392. *S. drummondii* Steud. *Synops. Plant. glumac.* 1: 128 (1854).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 108 (1943); Hughes, *Kew Bull.* 1921: 17 fig. 15 (1921).

Vern.: Cottony Spear-grass. *Distr.*: Restricted in Victoria to the Mallee where apparently localized and rather uncommon (Far North-west and Little Desert, but records without precise location); N.S.W., S.A., W.A.

16. Hairs on mature lemma white or, if occasionally fulvous [in forms of *S. nervosa* and *S. semibarbata*], then either the glumes truncate or the awns plumose 18

Hairs on mature lemma golden-brown or fulvous; panicle narrow; glumes acuminate; awns minutely pubescent 17

17. Panicle very narrow, dense and many-flowered; glumes subequal, hyaline, pale, the lower \pm 10 mm. long; awn 4.5 cm. long (maritime grass):

393. *S. compacta* D. K. Hughes in *Kew Bull.* 1921: 24, fig. 31-31 A (1921).

Illust.: Hughes, *Kew Bull.* 1921: 27 fig. 31 (1921).

Vern.: Spear-grass. *Distr.*: Locally frequent on stabilized coastal dunes of eastern Victoria (e.g. Brighton, Wilson Prom.), probably also along the western coast but records lacking; S.A., Tas.

[This species may eventually prove to be conspecific with *S. flavescens* Labill. from southern Tasmania—an imperfectly known grass, the name of which has been erroneously applied to several distinct taxa on the Australian mainland.]

—Panicle rather loose and usually few-flowered; glumes unequal, purplish, the lower one 12-20 mm. long; lemma with callus 2-3 mm. long, and often with an apical collar crowned with hairs; awn 5-8 cm. long (typically a Mallee grass):

394. *S. eremophila* F. M. Reader in *Vict. Nat.* 17: 154 (1901).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 110 (1943); Hughes, *Kew Bull.* 1921: 23 fig. 28 (1921), as "*S. rudis*".

Vern.: Desert Spear-grass. *Distr.*: Scattered through open sandy tracts of far western Victoria and locally abundant in the Mallee (Lower Glenelg R., Wando Vale, Big Desert, Mildura, extreme North-west, Swan Hill); N.S.W., S.A., W.A.

18. Lower glume 17-25 mm. long; lemma 10 mm. or more long; awn stout, rigid, 7-10 cm. long 20
 Lower glume 10-15 mm. long; lemma 5-10 mm. long; awn slender, 3-7 cm. long 19
19. Panicle rather dense, many-flowered; glumes almost equal, long-acuminate, often purplish and rather firm (maritime grass):

395. *S. elatior* (Benth.) D. K. Hughes in *Kew Bull.* 1921: 24, fig. 32-32 A (1921).
S. scabra Lindl. var. *elatior* Benth. *Flor. aust.* 7: 571 (1878).

Illust.: Hughes, *Kew Bull.* 1921: 27 fig. 32 (1921).

Vern.: Spear-grass. *Distr.*: Occasional on stabilized dunes along the central coastal tracts of Victoria (French Id, Port Phillip Bay, Anglesea), but doubtless more widespread and overlooked; Tas., S.A., W.A.

—Panicle loose, usually few-flowered (<40); glumes unequal (the upper 2-4 mm. shorter), long-acuminate, purplish; hairs on lemma often becoming \pm *fulvous* (typically a Mallee grass):

S. eremophila F. M. Reader [See No. 394].

—As for the last, but glumes *truncate* at apices and the long lax panicle often many-flowered (widespread grass of hill and gully country in eastern Victoria):

396. *S. nervosa* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 335 (1951).
S. pubescens sens. Morris in Ewart *Flor. Vict.* 182 (1931) pro parte, atque auctt. plur., non R. Br. (1810).

Illust.: Nil.

Vern.: Spear-grass. *Distr.*: Rather frequent in many parts of eastern Victoria, from the coast to the sub-alps (e.g. Mallacoota, Mt. Drummer, Cann R., Orbost, Tostaree near Nowa Nowa, Sale, Bidwell on Upper Delegate R., Switzerland near Yea), also Creswick, but precise range unknown owing to confusion with *S. pubescens* which it tends to replace in damper, shadier situations; N.S.W. (chiefly tablelands), Qd (far south-east).

[Under the original description J. W. Vickery (*l.c.* 337) also describes and records for Victoria (Lilydale, Warburton, Trafalgar) the var. *neutralis*—having a wider range than the typical form, and differing in the rather larger dimensions of all its parts.]

20. Leaf-blade \pm *scabrid*, to 18" long, hardly pungent-pointed; culm 2-4 ft. high, >20-flowered; glumes with *truncate*, soon-torn apices; lemma 9-12 mm. long (non-alpine):

397. *S. pubescens* R. Br. *Prodr. Flor. Nov. Holl.* 174 (1810).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 95 (1931); Hughes, *Kew Bull.* 1921: 23 fig. 27 (1921).

Vern.: Tall Spear-grass. *Distr.*: Widespread and frequent throughout the cooler parts of Victoria (heath, grassland and more open forests from the Lower Glenelg R. and Grampians to the Goulburn Valley and Upper Snowy R., but apparently absent from the Mallee and higher alps); all States except W.A.

—Leaf-blade quite *glabrous*, <9" long, very rigid and almost *pungent-pointed*; culm <2 ft. high, usually <20-flowered; glumes shortly acuminate but soon torn; lemma 12-15 mm. long (alpine grass):

398. *S. nivicola* J. H. Willis in *Vict. Nat.* 73: 149 (1957).

Illust.: Nil.

Vern.: Alpine Spear-grass. *Distr.*: Extremely localized in Victoria where restricted to two small areas in the alps (viz. Mt. Buffalo, and sources of Middle Ck on the Bogong High Plains), and rather infrequent; also N.S.W. (Kosciusko Plateau).

[*S. scabra* Lindl. 1848, based upon material from the Bogan River, Queensland, is reputed to have a long glabrous ligule, as in *S. setacea* R. Br. The name has been applied to Victorian grasses indistinguishable from *S. variabilis* Hughes—a very common widespread species with short ciliate ligule—and the description of *S. scabra* given by Morris in Ewart's *Flora of Victoria* 180 (1931) certainly applies to *S. variabilis*. No collection entirely comparable with the definition of *S. scabra* being available from this State, it is thought proper to omit the name until its type can be critically re-examined and compared with those of both *S. variabilis* and *S. setacea*. *S. aphanoneura* D. K. Hughes 1921, recorded for the Murray River (Vic.), is also omitted because of uncertainty—recent descriptions by Morris in Ewart and by Black in their respective floras might equally apply to *S. variabilis*, yet the former grass is placed near *S. setacea* despite a short ciliate ligule.]

144. **NASSELLA* E. Desv. (1853)

399. **N. trichotoma* (Nees) Hack. ex Arech. in *An. Mus. nac. Montevideo* 14: 336 fig. 19 (1896).

Stipa trichotoma Nees in Mart. *Flor. brasil.* 2¹ (*Agrostologia brasiliensis*): 375 (1829).

Illust.: Arechavaleta (*l.c.*); Davey in Green, *Agric. Gaz. N.S.W.* 67: 10-11 (1956); Blacklow, *Tasm. J. Agric.* 31: 461 (1960); Cross in Carn, *Control of Weeds*, N.S.W. 47 (1939); Davey in Allan, *N.Z. J. Agric.* 63: 91 (1941).

Vern.: Nassella Tussock (Serrated Tussock, Yass River Tussock). *Distr.*: Indigenous to Argentina, in pampas country; introduced into N.Z. (South Id, where first noted in 1928), N.S.W. (Bathurst to Nimmitabel, first noted near Yass in 1935), Tas. (Sandford near Hobart, noted first in 1956) and Victoria where now firmly established around Broadmeadows (first collected in 1954) and Eltham, but recently appearing on properties near Elaine and Mt. Egerton in the Ballarat district and near Hamilton.

Diagn.: Dense, harsh, deep-rooting perennial tussock to 20" high and broad; leaves to 20" long, filiform-terete (only \pm 0.3 mm. wide), minutely scabrid; ligule hyaline, auriculate, 0.5-1 mm. high; culms with inflorescences 18-30" high, rising from whitish \pm swollen leaf-bases; panicle 6-10" long, much-branched, diffuse, lax, often drooping, the branches long-filiform and whole inflorescence easily detached; spikelet 1-flowered, often purplish, plump around the grain; glumes subequal, 6-10 mm. long, 3-nerved, tapering above into long-acuminate, hyaline, awn-like points, \pm ciliate on lower concave margins; lemma obovoid, 2-3 mm. long, pale, slightly ribbed and minutely tuberculate-scabrid; awn terminal, 2-4 cm. long, minutely scabrid, very fine, straight or slightly flexuose, twisted in lower third, arising toward one side of the broad, flattish lemma-summit; callus rather blunt, with white hair-tuft almost half as long as lemma; anthers linear, \pm 1 mm. long.

[*N. trichotoma* has spread so alarmingly in New Zealand and on the south-central tablelands of New South Wales within a few years, to the exclusion of useful pasture plants, that it has been declared noxious for all shires where it is known to occur. In New Zealand *Nassella* was described (1957) by Dr. C. M. Smith as "the worst of the noxious pastoral weeds of recent occurrence", resistant "to all of even the most modern controls".]

145. **ORYZOPSIS* Michx. (1803)

400. **O. miliacea* (L.) Benth. & Hook. f. ex Aschers. & Schweinf. in *Mém. Inst. égypt. (Égypte)* 2: 169 (1887).

Agrostis miliacea L. *Spec. Plant.* 1: 61 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 53 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 111 (1943); Morris in Ewart, *Flor. Vict.* fig. 96 (1931); J. Dep. Agric. S. Aust. 10: 418 (1907), as "*O. milaceum*"; Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 625 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1: fig. 291 (1923); Javorka & Csapody, *Icon. Flor. Hungar.* 19 (1929); Davy, *Rep. agric. Sta. Calif.* t. 14 (1898).

Vern.: Rice Millet (Many-flowered Millet-grass, Smilo-grass—U.S.A.). *Distr.*: Indigenous to the Mediterranean region, Madeira and Canary Is; introduced into N. Amer., N.Z., all Australian States except Qd (?), and an occasional weed in settled areas of Victoria, usually on waste land about towns (e.g. Melbourne, Geelong, Queenscliff, Rochester, Mildura).

Diagn.: Tufted glabrous perennial with rigid, wiry, leafy culms 2-4 ft. high; leaf-blades 3-12" long (usually 6-9"), 4-7 mm. wide, flat, finely acuminate, rather harsh, glossy, often drooping, many-ribbed and scabrous above, smooth beneath; ligule 2-3 mm. long, very obtuse, truncate, hyaline; panicle widely open and ornamental, with numerous verticillate branches, 4-8" long, 3-5" wide; spikelets numerous, 1-flowered; glumes subequal, \pm 3 mm. long, acuminate, hyaline, often purple-tinted; lemma \pm 1.8 mm. long, smooth, ovoid, notched at summit, hardened around fruit and shining at maturity, bearing a terminal, deciduous, straight awn 3-4 mm. long; palea equal, 2-nerved; anthers 1 mm. long, cream.

Tribe PANICEÆ

146. PANICUM L. (1753)

1. Panicle 1-2" long, narrow, hardly exceeding leaves, with very few (1-5) short erect branches; lower glume hyaline, *obtusish*, $< \frac{1}{3}$ the length of upper; spikelet 2-3 mm. long, ovate-elliptic, *not* gaping, pale green with darker striæ (mud-loving, weakly ascending annual < 1 ft. high):

401. *P. obseptum* Trin. *Gramin. Panic.* 2: 149 (1826).

Illust.: Nil.

Vern.: White Water Panic. *Distr.*: Known in Victoria only by three collections from northern irrigation areas, viz. Bandiana on Kiewa R. flats near Wodonga (Mar. 1949), Corop Lakes near Rochester (Mar. 1956), Lockington (Feb. 1960), and perhaps a recent introduction to the State; otherwise indigenous to N.S.W. and Qd.

- Panicle usually 2-4" long, rather narrow, *sparingly branched*; lower glume opaque, *acuminate*, $\pm \frac{1}{2}$ the length of upper; spikelet 2 mm. long, ovoid, *gaping early*, usually \pm purplish (rigidly erect perennial to 1 ft. high, in far east of State):

402. *P. fulgidum* D. K. Hughes in *Kew Bull.* 1923: 323 (1923).

P. bicolor R. Br. *Prodr. Flor. Nov. Holl.* 191 (1810), *non* Moench. (1794).

Illustr.: Grosse in Turner, *Agric. Gaz. N.S.W.* 3: t. 15 opp. 234 (1892), also *Aust. Grasses* t. opp. 35 (1895)—both as "*P. bicolor*".

Vern.: Two-colour Panic. *Distr.*: Noted as "abundant on sedge-flats" at Maramingo Ck about 6 miles northerly from Genoa, extreme S.E. Victoria (Dec. 1947), but unknown elsewhere in the State; also N.S.W., Qd, N. Terr.

- Panicle >4" long, *widely spreading*, with *numerous* capillary branches 2
2. Lower glume $\frac{2}{3}$ the length of spikelet, strongly costulate, opaque; spikelet acute, 3-4 mm. long, green or purplish, on long-filiform pedicels; lower panicle-branches verticillate (glabrous perennial 1-3 ft. high; ligule prominent, hairless, 2-4 mm. long):

403. *P. prolutum* F. Muell. in *Trans. Vict. Inst.* 46 (1855).

Illustr.: Grosse in Turner *Agric. Gaz. N.S.W.* 2: t. 19 opp. 123 (1891), also *Aust. Grasses* t. opp. 42 (1895).

Vern.: Rigid Panic (Pallid Panic-grass). *Distr.*: Widespread and not uncommon on open plains and savannahs of western and northern Victoria, especially the Murray and Goulburn Valleys (e.g. Kiata and Dimboola districts, Hopetoun, Mildura, Swan Hill, Piangil, Lara, Toolern, St. Albans near Melbourne, Nathalia, Dookie, St. James, Springhurst); interior of all mainland States except W.A. (?).

- Lower glume $< \frac{2}{3}$ (usually $\frac{1}{2}$ – $\frac{2}{3}$) the length of spikelet; ligule a minute ciliate rim <1 mm. high 3
3. Leaves entirely *glabrous* (if sometimes hairy, then rhizomic and with leaves 6-20 mm. wide); panicle-branches *scattered* (grasses 2-5 ft. high) 5
—Leaf-sheaths (and sometimes blades also) \pm *hairy*; panicle-branches *clustered*, the lower often \pm verticillate (whole panicle sometimes breaking away at maturity); spikelets 2-2.5 mm. long 4
4. Leaf-blades 5-15 mm. broad, *hispid* with tubercle-based hairs, often crinkled on margins; panicle *enclosed* at base until maturity (tufted annual):

404. **P. capillare* L. *Spec. Plant.* 1: 58 (1753).

Illustr.: Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 128 (1940); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1042 (1951); Gleason, *New Britton & Brown Ill. Flor. N.E. United States & Canada* 1: 214 (1952); Gill in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 231 (1940); Britton, *Flor. Bermuda* 16 (1918); Georgia, *Manual Weeds* fig. 6 (1914); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3031, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3959 (1906); Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 191 fig. 518, col. (1850).

Vern.: Witch-grass. *Distr.*: Indigenous to North America (where becoming a weed of cultivated ground); introduced into warmer parts of W. Europe, N.Z., N. Cal., N.S.W., W.A. and Victoria where scattered through northern irrigation settlements and locally abundant (e.g. Mildura, Red Cliffs, Tatura, Mansfield).

—Leaf-blades 2.5 mm. broad, sparsely and *softly hairy*, not crinkled; panicle soon *long-exserted* and widely spreading (perennial tussock):

405. *P. effusum* R. Br. *Prodr. Flor. Nov. Holl.* 191 (1810).

Illustr.: Black, *Flor. S. Aust.* ed. 2: fig. 86 (1943); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 25 (1923), also *Agric. Gaz. N.S.W.* 30: 487 (1919); Grosse in Turner, *Agric. Gaz. N.S.W.* 3: t. 29 opp. 389 (1892), also *Aust. Grasses* t. opp. 37 (1895).

Vern.: Hairy Panic (Branched Panic-grass). *Distr.*: Widespread through western, northern and far eastern Victoria, on both grassland plains and more open drier woodland, but not common (Mt. Arapiles, Horsham, Dimboola, ? Far North-west, Piangil, Cornishtown, Towong, Suggan Buggan, Deddick, Buchan, Bairnsdale district, Little River and Lara on Keilor basalt plains near Melbourne); all States except Tas., Cent. Aust.

5. Spikelets *green, white or purplish, acute to acuminate*, 2.5-3 mm. long, soon gaping, on ascending and \pm rigid panicle-branches; lower glume *clasping*, pointed, $\frac{1}{3}$ - $\frac{1}{2}$ the length of upper glume which has 7-9 nerves (perennial with rhizomes or stolons, sometimes \pm hairy):

406. **P. coloratum* L. *Mant. Plant.* 1: 30 (1767).

Illustr.: Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 291 (1955); Lauth in Wood, *Natal Plant.* 2³: t. 160 (1903).

Vern.: Coolah Grass. *Distr.*: Indigenous to Africa (from Egypt to S. Afr.); introduced into Qd (planted only), N.S.W. and Victoria where frequent in north-eastern irrigation districts (Echuca, Tongala, Kyabram, Mooroopna, Yarrowonga, Wodonga, Tallangatta, Noorongong, Corryong), with an isolated occurrence at St. Arnaud, and perhaps overlooked along the Murray Valley north-west from Echuca.

—As for the last, but panicle at first enclosed by uppermost leaf-sheath, at length with branches *very wide-spreading* (to 12"), and the *truncate* lower glume $< \frac{1}{2}$ the length of spikelet (usually an annual):

407. *P. decompositum* R. Br. *Prodr. Flor. Nov. Holl.* 191 (1810).

Illustr.: Gauba, *Vict. Nat.* 65: 112 fig. A (1948), as "var. *biflorum*"; Black, *Flor. S. Aust.* ed. 2: fig. 84 (1943); E. F. P. in Breakwell, *Agric. Gaz. N.S.W.* 30: 85 (1919), also *Grasses & Fodder Plant. N.S.W.* fig. 20 (1923); Turner, *Agric. Gaz. N.S.W.* 3: t. 40 opp. 641 (1892), also *Aust. Grasses* t. opp. 36 (1895) Turner, *J. Dep. Agric. W. Aust.* 13: 73, 441 (1906).

Vern.: Australian Millet (Native Millet, Umbrella Grass). *Distr.*: Rare in Victoria and known by only a very few collections from plain country (e.g. Braybrook where plentiful along railway line in Jan. 1905, Tennyson district near Rochester in Apr. 1958, ? Far North-west), but exact range uncertain owing to confusion with the very similar, introduced *P. coloratum*; damp places in interior of all mainland States, Cent. Aust., ? N.G., ? Indonesia.

—Spikelets dark tawny to blackish, \pm obtuse, 2 mm. long, not gaping, on lax diffuse and filiform panicle-branches; lower glume quite flat; upper glume 5-nerved:

408. *P. bisulcatum* Thunb. in *Nov. Acta Soc. Sci. upsal.* 7: 141 (1815).

P. acroanthum Steud. *Synops. Plant. glumac.* 1: 87 (1854).

Illust.: Gross in Turner, *Agric. Gaz. N.S.W.* 2: t. 52 opp. 562 (1891), also *Aust. Grasses* t. opp. 40 (1895)—both as "*P. melananthum*"; Terasaki, *Nippon Shokubutsu Zufu* [Jap. Bot. Ill. Album] 1904 (1933).

Vern.: Black-seed Panic. *Distr.*: Rare in Victoria where known by only a few collections from the north-east (valleys of the King, Buffalo, Ovens and Upper Murray Rivers); N.S.W., Qd, ? N.G., S.E. Asia, Japan.

[*P. airoides* R. Br. and *P. mitchellii* Benth. were admitted as Victorian by Morris in Ewart's *Flor. Vict.* 127-28 (1931), but there are no available specimens from the State to substantiate these records. The first is a tropical grass, most unlikely to be found as far south as the Murray River—whence D. K. Hughes recorded it in *Kew Bull.* 1923: 324 (1923)—and either the locality or identification is surely open to question. *P. mitchellii* is a Queensland species, unknown from either New South Wales or South Australia, and Victorian specimens so determined have proved referable to *P. effusum* R. Br. The stout hairy Eurasian *P. miliaceum* L. (Millet Panic) has very numerous spikelets 4-5 mm. long, is naturalized in New South Wales and, according to C. A. Gardner's *Flor. W. Aust.* 1¹ (Gramineæ): 257 (1952), "cultivated in many parts" of Western Australia; it has been grown occasionally in Victorian gardens, and may appear for a time where bird-seed is split.]

147. PASPALIDIUM Stapf (1920)

Leaves 2-5 mm. broad; culms 1-3 ft. high; panicle usually $>5"$ long; spikelets all subsessile, close together and evenly arranged in 2 rows from base to top along the erect linear branches (1-2 cm. long):

409. *P. jubiflorum* (Trin.) D. K. Hughes in *Kew Bull.* 1923: 317 (1923).

Panicum jubiflorum Trin. *Gramin. Panic.* 2: 130 (1826).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 80 (1943); Breakwell, *Agric. Gaz. N.S.W.* 30: 83 (1919), also *Grasses & Fodder Plant. N.S.W.*: fig. 19 (1923)—both as "*Panicum flavidum*"; Turner, *Agric. Gaz. N.S.W.* 4: t. 11 opp. 149, t. 12 opp. 150 (1893), as "*Panicum flavidum*"; Bailey, *Ill. Monogr. Grasses Qd* 1: t [29] (1878), as "*Panicum flavidum*".

Vern.: Warrego Summer-grass (Warrego Grass, Yellow-flowered Panic-grass, Vandyke Grass—Qd). *Distr.*: Scattered through far western and northern Victoria, usually in damp places and locally abundant (Yarriambiack Ck near Warracknabeal, Mildura, Kulkyn Nat. Forest, Kerang, Echuca, Yarrawonga, Rutherglen), with an isolated record from Bacchus Marsh; interior of all States except Tas.

Leaves 1-3 mm. broad; culms about 1 ft. high (seldom more); panicle $<5"$ long; spikelets variously stalked (at least some always pedicellate), irregularly arranged in short loose racemes, sometimes forming distant clusters (panicle-branches rarely >1 cm. long):

410. *P. gracile* (R. Br.) D. K. Hughes in *Kew Bull.* 1923: 318 (1923).*Panicum gracile* R. Br. *Prodr. Flor. Nov. Holl.* 190 (1810).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 73 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 81 (1943); Morris in Ewart, *Flor. Vict.* fig. 49 (1931); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.*: fig. 26 (1923), also *Agric. Gaz. N.S.W.* 30: 489 (1919)—both as "*Panicum gracile*"; Grosse in Turner, *Agric. Gaz. N.S.W.* 3: t. 21 opp. 317 (1892), also *Aust. Grasses* t. opp. 38 (1895)—both as "*Panicum gracile*".

Vern.: Slender Panic (Graceful Panic-grass). *Distr.*: Scattered in Far North-west (Mildura), Swan Hill district and far eastern Victoria (Snowy R. gorge, Suggan Buggan & Deddick, where inhabiting dryish and often rocky terrain), but uncommon; all States (only as an occasional introduction in Tas.), N. Terr., N. Cal.

148. **ECHINOCHLOA* Pal. Beauv. (1812)

Racemes dense, bristly at the base; spikelets frequently tinged with purple, ± hispid, awned or long-pointed:

411. **E. crus-galli* (L.) Pal. Beauv. *Ess. Agrost.* 53, t. 11 fig. 2 (1812).*Panicum crus-galli* L. *Spec. Plant.* 1: 56 (1753).

Illust.: Palisot de Beauvois (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 82 (1943); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 22 (1923), as "*Panicum crus-galli*"; Grosse, *J. Dep. Agric. S. Aust.* 10: 843 (1907), as "*Pameum crus-galli*"; Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 127 (1940); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 312 (1955); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 336 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 63 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1086 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 243 (1940); Herter, *Flor. il. Uruguay* 1: fig. 505 (1942); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1165 (1931), as "*Panicum crus-galli*"; Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3033, col. (1930–31), as "*Oplismenus crus-galli*"; Coste, *Flor. Franc.* 3: fig. 3963 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 23 fig. 3, col. (1907), as "*Panicum crus-galli*"; Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 191 fig. 516, col. (1850).

Vern.: Barnyard Grass (Barnyard Millet, Cockspur Grass). *Distr.*: Almost cosmopolitan; but probably an introduction in most cooler regions, including S. Afr., temperate S. Amer., N.Z., N. Cal. and temperate parts of all Australian States. It is a frequent weed around settlements in many parts of Victoria, except in snow country, but is apparently rare in Tasmania.

[The var. *frumentacea* (Link, *ut sp.*) W. F. Wight in *Century Dict.* 11: 810 (1909) is Japanese Millet or "Billion-dollar Grass"—a robust cultivated form with very broad leaves (1-2 cm. wide), much larger denser panicles and more turgid almost awnless, spikelets. It is grown occasionally for fodder in Victoria, but seldom persists as a naturalized plant; spontaneous occurrences have been noted along the Elster Canal at Brighton, Warrnambool, Wimmera R. at Dimboola and near Kaniwa.]

Racemes rather loose, simple and ± distant, devoid of hairs at base; spikelets usually pale-green, minutely pubescent, shortly pointed and awnless:

412. **E. colonum* (L.) Link *Hort. bot. Berol.* 2: 209 (1833).*Panicum colonum* L. *Syst. Nat.* ed. 10, 2: 870 (1759).

Illust.: Senaratna, *Grasses Ceylon* t. 22 (1956); Trevithick in Hubbard & Vaughan, *Grasses Mauritius & Rodriguez* 70 (1940); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 62 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1085 (1951); Gill in Abrams, *Ill. Flor. Pacific States I*, ed. 2: fig. 245 (1940); M.C.R. in Cabrera, *Manual Flor. Alrededores B. Aires*, fig. 27 (1953); Herter, *Flor. il. Uruguay I*: fig. 504 (1942); Coste, *Flor. Franc.* 3: fig. 3962 (1906).

Vern.: Awnless Barnyard Grass (Shama Millet, Jungle-rice—U.S.A.). *Distr.*: Indigenous to tropical regions of the Old World, including northern Australia, and extending to S. Africa; introduced into N. & S. Amer., N.Z. (North Id), N. Cal., N.S.W., and Victoria where at present known from only two localities, viz. Corio (Apr. 1961—casual occurrence in a garden) and Robinvale (June 1961), but probably overlooked owing to confusion with the common *E. crus-galli*.

149. NEURACHNE R. Br. (1810)

413. *N. alopecuroidea* R. Br. *Prodr. Flor. Nov. Holl.* 196 (1810).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 78 fig. A-B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 68 (1943); Morris in Ewart, *Flor. Vict.* fig. 37 (1931); Maiden, *Agric. Gaz. N.S.W.* 8: t. opp. 853 (1897), also *Manual Grasses N.S.W.* t. opp. 66 (1898); A. M. C. in Hook *Icon. Plant.* 13: t. 1241 (1877)—all as "*N. alopecuroidea*".

Vern.: Fox-tail Mulga Grass. *Distr.*: Scattered, but locally frequent, on drier heathland and Mallee sand-hills throughout far western and north-western Victoria (e.g. Kulkyn Nat. Forest, Wyperfeld Nat. Park, Big & Little Deserts, Jeparit, Dimboola, Mitre Lake, Black Range, Grampians, Stawell, Moyston), with an isolated occurrence near Hawkesdale; S.A., Cent. Aust., W.A., ? N.S.W. (no specimen in Sydney Herbarium).

Diagn.: Coarse tufted perennial, \pm bulbous at base; leaf-blades 1.5-3" long, 1.5-3 mm. wide, rigid, acuminate, flat to \pm inrolled, deeply ribbed, \pm smooth above but usually with scattered tubercle-based hairs on margins and lower surfaces; ligule a ring of dense white hairs; culms to 18" high; inflorescence a dense, oblong to ovoid, silky-hairy, dark spike 0.5-1.5" long; spikelet (including awns) 7-12 mm. long; glumes acuminate with awn-like points, villous-ciliate along intramarginal nerves (the lower 7-9 mm. long, with flattened, glabrous, 3- to 5-nerved back, the upper 9-11 mm. long, 7- to 11-nerved and sparsely pubescent on back); sterile lemma 7 mm. long, obtuse, 5- to 7-nerved; lemma 6 mm. long, hyaline, 3-nerved, glabrous or with ciliate margins; palea similar; styles united at base, purple, tassel-like, \pm 3 mm. long; anthers golden, relatively large, 2.3-5 mm. long and 1 mm. broad.

[*N. mitchelliana* Nees in Hook. *Lond. J. Bot.* 2: 410 (1843) occurs on the Murray Lands of South Australia, and was admitted as Victorian also by Morris in Ewart's *Flor. Vict.* 119 (1931). The record was based on a single collection (from C. Walter's herbarium), labelled "N.W. Victoria, May 1898", and is open to question. No one seems to have noted this grass in Victoria during the present century. *N. mitchelliana* differs from *N. alopecuroidea* in having cylindrical spikes 1-2" long, smaller less hairy spikelets and obtuse glumes, the outer of which has a large transparent and framed cavity in its lower half.]

150. ENTOLASIA Stapf (1920)

414. *E. marginata* (R. Br.) D. K. Hughes in *Kew Bull.* 1923: 331 (1923).
Panicum marginatum R. Br. *Prodr. Flor. Nov. Holl.* 190 (1810);
Digitaria marginata sens. Morris in *Ewart Flor. Vict.* 129 (1931), *non*
 Link (1821).

Illust.: Wills in Maiden, *Agric. Gaz. N.S.W.* 7: t. opp. 8 (1896), also *Manual Grasses N.S.W.* t. opp. 46 (1898)—both as "*Panicum marginatum*".

Vern.: Bordered Panic. *Distr.*: Confined in Victoria to near-coastal areas of East Gippsland where not uncommon (e.g. Deadcock Ck near Glenaladale, Sarsfield, Newton's Ck, Marlo plains, Coringle & Lake Curlip near mouth of Snowy R.); also N.S.W., Qd.

Diagn.: Apparently perennial, ascending, rigid but slender grass, to 1 ft. high; leaf-blades \pm lanceolate, flat, 1-4" long, 2-5 mm. (rarely to 10 mm.) wide, long-acuminate, finely ribbed with very numerous scabrid veins and with pale thickened marginal veins; sheaths septate-nodulose; ligule a collar of short white hairs; panicle narrow, 1-3" long, with few (3-6) erect or slightly spreading branches; spikelets irregularly crowded, obtusish, 2-3 mm. long; lower glume \pm 0.4 mm. long, abaxial, hyaline, blunt, very broad, 1- to faintly 3-nerved; upper glume as long as spikelet, glabrous, 3- to 5-nerved and prominently ribbed; sterile lemma similar; fertile lemma \pm 2 mm. long, slightly hardened, densely pubescent to villous; palea smaller but similar; anthers narrow-elliptic, 0.7 mm. long; stigmas dark purple; grain pallid, blunt, broadly ellipsoid, to 2 mm. long.

151. OPLISMENUS Pal. Beauv. (1810)

415. *O. æmulus* (R. Br.) Kunth *Rév. Gramin.* 44 (1829).
Orthopogon æmulus R. Br. *Prodr. Flor. Nov. Holl.* 194 (1810);
Oplismenus compositus sens. Morris in *Ewart Flor. Vict.* 132 (1931),
 atque auctt. Aust., *non* (L., ut *Panicum*) Pal. Beauv. (1812).

Illust.: Morris in *Ewart, Flor. Vict.* fig. 51 (1931); Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. 41 opp. 440 (1891), also *Aust. Grasses* t. opp. 34 (1895)—all as "*O. compositus*".

Vern.: Australian Basket-grass (Creeping Beard-grass). *Distr.*: Scattered through moist shady places in patches of jungle on and east of the Lower Snowy R., far eastern Victoria (e.g. Lake Curlip, Cann R., Mt. Drummer, Genoa R. gorge); also N.S.W., Qd, ? N. Cal., N.G.

Diagn.: Weak, rather delicate perennial, creeping and rooting at nodes, the branches sometimes ascending to about 1 ft.; leaf-blades broad-lanceolate or sometimes narrow-lanceolate, flat, glabrous, 1-2" long (rarely more), 3-7 mm. wide, strongly lined with up to 25 veins, the margins often a little undulate or crinkled; ligule a fringe of dense cilia to 1 mm. high; inflorescence a slender panicle of abbreviated, rather distant branches 0.5-3 cm. long, or appearing as a raceme with almost sessile clusters of spikelets unevenly disposed; spikelets pale green, narrowly ovoid, 2-3 mm. long (without awns), each group subtended by a few long white hairs; glumes \pm 2 mm. long, 5-nerved, \pm bristly, the lower tapering into an awn 3-7 mm. long, the upper very shortly awned or only acuminate; sterile lemma similar but slightly longer, awnless; fertile lemma pale, smooth, shining and nerveless; palea similar, 2-2.5 mm. long; anthers linear, 1.2 mm. long.

152. DIGITARIA Hall. (1768)

1. Spikelets beset with long silky hairs; panicle-branches *not* digitate (perennials) 3
 —Spikelets glabrous or only sparsely and shortly pubescent; panicle-branches clustered at end of culm and \pm *digitate* (annuals) 2
2. Leaf-sheaths (and often under-surfaces of blades) bearing scattered *tubercle-based hairs*; spikelet 3 mm. long, with 3 *strong raised nerves* on back of sterile lemma:

416. **D. sanguinalis* (L.) Scop. *Flor. carniol.* ed. 2, 1: 52 (1772).

Panicum sanguinale L. *Spec. Plant.* 1: 57 (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 67 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 75 (1943); Morris in Ewart, *Flor. Vict.* fig. 48 (1931); Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 129 (1940); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.*: fig. 21 (1923), as "*Panicum sanguinale*"; Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. 21 opp. 173 (1891), also *Aust. Grasses* t. opp. 43 (1895)—both as "*Panicum sanguinale*"; Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 344 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 827 (1951); Herter, *Flor. il. Uruguay* 1: fig. 460 (1942); Poincot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3037, col. (1930–31); Coste, *Flor. Franc.* 3: fig. 3964 (1906); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1160 (1931), as "*Panicum sanguinale*"; Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 187 fig. 507, col. (1850).

Vern.: Summer Grass (Hairy Finger-grass, Crab-grass—U.S.A.). *Distr.*: Indigenous to S. Europe and Asia; introduced into N. & S. Amer., S. Afr., N.Z. and all Australian States, being a frequent weed almost throughout the lowland districts of Victoria wherever water is available during the warmer part of the year (it is a summer pest of suburban gardens, disappearing at the onset of winter).

—Leaves quite *glabrous*; spikelet 2 mm. long, the nerves of sterile lemma fine, indistinct and *not raised*:

417. **D. ischæmum* (Schreb.) Muehl. *Descr. Gramin.* 131 (1817).

Panicum ischæmum Schreb. in Schweigg. *Specim. Flor. erlang.* 16 (1804).

Illust.: Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 342 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 829 (1951).

Vern.: Smooth Summer Grass (Smooth Crab-grass, Smooth Finger-grass, Red Millet). *Distr.*: Indigenous to warm-temperate Europe and Asia; introduced into Britain, N. Amer., N.Z. (North Id), N.S.W. and Victoria where noted as an occasional weed at Brighton, Gelantipy (Mar. 1938), Cann River school-ground (1947) and Hamilton (June 1958), but hardly well-established yet.

3. Racemes 1-4, *sessile* (bearing spikelets from the base upwards); spikelets 3 mm. long, the upper of each pair on a pedicel 2-3 mm. long; lower glume subacute, 0.6-0.8 mm. long;

418. *D. brownii* (Roem. & Schult.) D. K. Hughes in *Kew Bull.* 1923: 313 (1923).
Panicum brownii Roem & Schult. *Syst. Veg.* 2: 462 (1817).

Illust.: E. F. P. in Breakwell, *Agric. Gaz. N.S.W.* 30: 486 (1919), also *Grasses & Fodder Plant. N.S.W.* fig. 24 (1923); Grosse in Turner, *Agric. Gaz. N.S.W.* 4: t. 1 opp. 1 (1893), also *Aust. Grasses* t. opp. 39 (1895); Bailey, *Ill. Monogr. Grasses Qd 1*: t. [30] (1878)—all as "*Panicum leucophæum*".

Vern.: Cotton Panic-grass (Weeping Cotton Grass). *Distr.*: Rare and apparently localized in Victoria, being known only from the Murray R. (without locality), Warracknabeal district (Mar. 1904) and Suggan Buggan in the far east (Sept. 1939); all States except Tas., Cent. Aust.

—Racemes > 4 (and up to 16), naked and devoid of spikelets at base for at least 2 cm., the lowest whorled 4

4. Spikelets 3-4 mm. long, ovate-lanceolate, the upper of each pair on a pedicel 4-5 mm. long; hairs no higher than spikelet, but often spreading widely sideways, usually absent from centre of the strongly veined back of sterile lemma; lower glume 0.8-1.2 mm. long, acute, the upper slightly shorter than sterile lemma:

419. *D. divaricatissima* (R. Br.) D. K. Hughes in *Kew Bull.* 1923: 314 (1923).
Panicum divaricatissimum R. Br. *Prodr. Flor. Nov. Holl.* 192 (1810).

Illust.: Wills in Turner, *Agric. Gaz. N.S.W.* 4: t. 20 opp. 305 (1893), as "*Panicum divaricatissimum* var. *normale*".

Vern.: Umbrella Grass (Spider Panic Grass). *Distr.*: Rare and localized in Victoria, where known by very few collections, viz., Far North-west (? Mildura district), Dimboola (June 1912) and Dalton's Bridge near Cohuna (June 1949); also N.S.W., Qd, ? Java.

—Spikelets 2-2.5 mm. long, ovate, the upper on a pedicel 2-3 mm. long; white silky hairs projecting far above spikelet and completely covering backs of upper glume and sterile lemma; lower glume minute, 0.5 mm. long or less, \pm obtuse (leaves often villose):

420. *D. ammophila* (Benth.) D. K. Hughes in *Kew Bull.* 1923: 313 (1923).
Panicum divaricatissimum R. Br. var. *ammophilum* Benth. *Flor. aust.* 7: 468 (1878);

Panicum ammophilum F. Muell. in *Trans. Vict. Inst.* 46 (1855), non Trin. (1829), nec Steud. (1854).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 76 (1943); E. F. P. in Breakwell, *Agric. Gaz. N.S.W.* 30: 485 (1919), also *Grasses & Fodder Plant. N.S.W.* fig. 23 (1923)—both as "*Panicum divaricatissimum*"; Wills in Turner, *Agric. Gaz. N.S.W.* 4: t. 21 opp. 305 (1893), as "*Panicum divaricatissimum* var. *ammophilum*".

Vern.: Silky Umbrella Grass. *Distr.*: Localized and rare in Victoria, where at present known only from the neighbourhood of Mildura (at Sandalong golf links, May 1949) and in Warracknabeal (Apr. 1961); all States except Tas., Cent. Aust.

[Dr. Joyce W. Vickery in *Contr. N.S.W. Herb.* 1: 324-6 (1951) has separated, and described, a distinct species *D. hystrichoides* from populations formerly all referred to *D. ammophila*. The new taxon is said to differ in its slightly longer sterile lemma (3 mm.) which is glabrous along the centre of the back, with stiff acicular hairs

mixed among the fine silky ones. A single collection is cited from Victoria—"Mallee district", 1887—in addition to many from New South Wales, but all Victorian collections of *D. ammophila* in Melbourne Herbarium conform exactly to Vickery's concept of the latter species. The "Murray River" record of *D. cænicola* (F. Muell.) D. K. Hughes in Ewart's *Flor. Vict.* 130 (1931) is based upon South Australian material, and no genuinely Victorian example is available. This species is extremely close to *D. divaricatissima*, from which it differs in the longer spikelets (± 5 mm.), equality of upper glume with sterile lemma, and longer hairs (1-3 mm.) in the axils of the raceme-whorl. An undescribed species of *Digitaria*, formerly included with *D. tenuissima* (Benth.) D. K. Hughes, occurs on the coastal and tablelands districts of New South Wales; in June 1952 it was collected at Walwa in far north-eastern Victoria. This small grass has only 3 or 4 short distant racemes, with glabrous spikelets (± 2 mm. long) from base to tip of each raceme.]

153. ERIOCHLOA Humb. et al. (1815)

421. *E. pseudoacrotricha* (Stapf ex Thell.) C. E. Hubbard ex S. T. Blake in *Trans. roy. Soc. S. Aust.* 67: 43 (1943).

E. ramosa Kuntze var. *pseudoacrotricha* Stapf ex Thell. in *Vjschr. naturf. Ges. Zürich* 64: 697 (1919);

E. punctata sens. Morris in Ewart *Flor. Vict.* 121 (1931), non (L., ut *Milium*) Desv. ex Hamilt. (1825).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 69 fig A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 73 (1943); Morris in Ewart, *Flor. Vict.* fig. 40 (1931), as "*E. punctata*"; Bailey, *Ill. Monogr. Grasses Qd 1*: t. [22] (1878), as "*E. punctata*".

Vern.: Early Spring Grass (Plain Grass). *Dist.*: Rare in Victoria, where known from only a few collections—chiefly in irrigation districts of the north—and perhaps not truly indigenous (Kyabram, Lockington near Echuca, Carwarp, 10 miles east from Kaniva, Werribee Research Farm), with an isolated sporadic occurrence at Dutson Downs near Sale (Mar. 1960); inland parts of all States except Tas., also Cent. & N. Aust.

Diagn.: Erect, almost glabrous perennial to 2 ft. high; leaf-blades 3-6" long and 2-4 mm. wide, long-acuminate, linear to linear-lanceolate, flat or \pm involute-setaceous in upper part, smooth or minutely scabrid, the venation often slightly septate-nodulose; ligule a collar of short, white, erect, often connivent hairs to 1 mm. long; panicle 2-5" long, consisting of 5-8 erect, rather distant, \pm scabrous, spike-like racemes, the lowermost being longest (± 2 "); spikelets pale green, secund in 2 rows along the slightly compressed rhachis, each 4-6 mm. long, ovate-acuminate, appressedly silky-hairy, sharply contracted below into a conspicuous bead-like, glabrous, purplish pedestal (0.3-0.5 mm. long) above the articulation; lower glume a minute nerveless scale on the bulbous part of pedicel; upper glume and sterile lemma similar, 4-5 mm. long, hairy, shortly acuminate, 3- to 5-nerved; fertile lemma smooth, flattened, white, ellipsoid, shining, 2-3 mm. long, with delicate terminal awn 0.5-1 mm. long; stigmas dark purple; anthers broad, ± 0.8 mm. long.

154. PASPALUM L. (1759)

Rhizomic and long-stoloniferous creeping perennial of damp ground; leaf-blades rarely to 6" long; culms ascending, <1 ft. high; spikes 2 (rarely several in some proliferous forms), close together at top of culm, erect or rigidly spreading, 2-5 cm. long; spikelet elliptic, glabrous:

422. *P. distichum* L. Syst. Nat. ed. 10, 2: 855 (1759).

Illustr.: Black, *Flor. S. Aust.* ed. 2: fig. 71 (1943); E. F. P. in Breakwell, *Agric. Gaz. N.S.W.* 30: 637 (1919), also *Grasses & Fodder Plant. N.S.W.* fig. 9 (1923); Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. 31 opp. 310 (1891), also *Aust. Grasses* t. opp. 45 (1895); Grosse, *J. Dep. Agric. S. Aust.* 10: 744 (1907); Buchanan, *Indig. Grasses N.Z.* t. 10 B (1877); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 331 (1955); Lauth in Wood, *Natal Plant.* 2^a: t. 135 (1900); Franks in Marloth, *Flor. S. Afr.* 4: t. 6 fig. A (1915); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 77 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 866 (1951); Gill in Abrams, *Ill. Flor. Pacific States I*, ed. 2: fig. 226 (1940); Herter, *Flor. il. Uruguay I*: fig. 475 (1942).

Vern.: Water Couch (Swamp Couch, Silt Grass, Knot-grass). *Distr.*: Indigenous to warm-temperate parts of both hemispheres and almost cosmopolitan (e.g. U.S.A., Argentina, S. Afr., Egypt, Pakistan), but apparently not European; N.Z., all Australian States except Tas. (?), and frequent in damp lowland parts of Victoria (e.g. Creswick, Geelong, Melbourne, Nathalia, Neerim, Gabo Id), spreading as a weed with settlement.

Tufted perennial, *non-stoloniferous*; leaf-blades 4-12" long; culms erect, 1-4 ft. high; spikes 3-10 (usually 3-5), *distant*, often *nodding*, 4-12 cm. long; spikelet *broadly ovate*, fringed with white-silky hairs (on edges of sterile lemma):

423. **P. dilatatum* Poir. in Encycl. méth. Bot. 5: 35 (1804).

Illustr.: Gardner, *Flor. W. Aust.* 1^a (Gramineæ): t. 71 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 72 (1943); Morris in Ewart, *Flor. Vict.* fig. 39 (1931); E. F. P. in Breakwell, *Agric. Gaz. N.S.W.* 30: 633, 635 (1919), also *Grasses & Fodder Plant. N.S.W.* fig. 6 (1923); J. Dep. Agric. S. Aust. 10: 417 (1907); Chambers in Maiden, *Agric. Gaz. N.S.W.* 10: t. opp. 32 (1899); Laurence in Chippindall, *Grasses & Pastures S. Afr.* t. 13 fig. 2 opp. 241, col. (1955); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 78 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 893 (1951); Gill in Abrams, *Ill. Flor. Pacific States I*, ed. 2: fig. 227 (1940); Herter, *Flor. il. Uruguay I*: fig. 492 (1942); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3035, col. (1930-31); Britton, *Flor. Bermuda* 13 (1918).

Vern.: Paspalum (Golden Crown Grass, Dallis Grass—U.S.A., Caterpillar Grass—Qd). *Distr.*: Indigenous to Argentina; introduced into Cent. & N. Amer., France, S. Afr., Java, N.Z., N. Cal., temperate parts of all Australian States including Victoria, where much used as a pasture plant in the north-east, but scattered as a weed in many open lowland situations of other districts (e.g. Melbourne area; Anglesea, Colac, Hamilton, Creswick, Daylesford, Far North-west, Arthur's Seat, Sunday Id, Lakes Entrance).

[**P. urvillei* Steud. (Vasey Grass), native to North and South America, has been recorded as naturalized in New South Wales, Western Australia, New Zealand and South Africa; it has appeared occasionally in the Melbourne suburban area, but is not yet established. *P. urvillei* closely resembles *P. dilatatum*, differing from the latter in its more numerous (12-20), almost erect racemes and densely hairy smaller spikelets (\pm 2 mm. long).]

155. *SETARIA Pal. Beauv. (1812)

- I.** Panicle-bristles (4-6 per spikelet) with *reflexed* barbs; upper glume as long as the *almost smooth* fertile lemma (panicle green or purplish):

424. **S. verticillata* (L.) Pal. Beauv. *Ess. Agrost.* 51 (1812).*Panicum verticillatum* L. *Spec. Plant.* ed. 2, 1: 82 (1762).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 89 (1943); Connell in Chippindall, *Grasses & Pastures S. Afr.* fig. 304 (1955); Franks in Marloth, *Flor. S. Afr.* 4: t. 6 fig. b (1915); Trevithick in Hubbard & Vaughan, *Grasses Mauritius & Rodriguez* 67 fig. 11 b (1940); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 338 fig. 2 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 85 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1096 (1951); Gill in Abrams, *Ill. Flor. Pacific States 1*, ed. 2: fig. 246 (1940), as "*Chætochloa verticillata*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1162 (1931), as "*Panicum verticillatum*"; Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3026, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3956 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 23 fig. 5, col. (1907); Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 188 fig. 511, col. (1850).

Vern.: Whorled Pigeon-grass (Bristle Pigeon-grass, Rough or Bur Bristle-grass).

Distr.: Indigenous to warmer parts of Europe, Asia and Indonesia, apparently also tropical America; introduced into Britain, S. Afr., U.S.A., N.Z., N. Cal., N.S.W., Qd, S.A. and Victoria where an occasional garden and pasture weed (e.g. Melbourne suburbs, Avoca, Warrnambool, Hamilton).

—Panicle-bristles with barbs *directed forwards*

2

2. Bristles yellowish, *much longer* than the pallid spikelets; upper glume manifestly *shorter* than the *strongly and transversely rugose* fertile lemma (annual):

425. **S. glauca* (L.) Pal. Beauv. *Ess. Agrost.* 51 (1812).*Panicum glaucum* L. *Spec. Plant.* 1: 56 (1753);

S. lutescens (Weigel, ut *Panicum* sp.) F. T. Hubbard in
Rhodora 18: 232 (1916).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 88 (1943); White, *Qd agric. J.* 30: 315 t. 43 (1913); Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 32 (1923); Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. 42 opp. 441 (1891), also *Aust. Grasses* t. opp. 48 (1895); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 340 (1954); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 83 (1957), as "*S. lutescens*"; Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1094 (1951), as "*S. lutescens*"; Gill in Abrams, *Ill. Flor. Pacific States 1*, ed. 2: fig. 247 (1940), as "*Chætochloa lutescens*"; Herter, *Flor. il. Uruguay 1*: fig. 533 (1942), as "*S. lutescens*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1163 (1931), as "*Panicum glaucum*"; Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3027, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3954 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 1: t. 23 fig. 4, col. (1907); Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 188 fig. 509, col. (1850).

Vern.: Pale Pigeon-grass (Yellow Bristle-grass, Glaucous Bristle-grass). *Distr.*: Indigenous to warm-temperate regions of Europe and Asia, perhaps also of Indonesia and northern Australia; introduced into Britain, S. Afr., N. & S. Amer., N.Z., N. Cal., Qd, N.S.W., S.A. and Victoria where occasional on damp ground in northern districts (e.g. Bendigo, Goulburn R., Ovens R., Tallangatta), also Glenburn in south and Wangrabelle near Genoa in far east.

—Bristles *not or hardly exceeding* the green or purplish spikelets; upper glume *as long as the slightly rugulose* fertile lemma (rhizomic perennial with narrowly cylindrical spikes):

426. **S. geniculata* (Lam.) Pal. Beauv. *Ess. Agrost.* 51 (1812).

Panicum geniculatum Lam. in *Encycl. méth. Bot.* 4: 727 (1798).

Illust.: Pomeroy in Mason, *Flor. Marshes Calif.* fig. 84 (1957); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1095 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 249 (1940), as "*Chatochloa geniculata*"; Herter, *Flor. il. Uruguay* 1: fig. 534 (1942); Silveus, *Texas Grasses* 676 (1933).

Vern.: Slender Pigeon-grass (Bent Pigeon-grass, Knotroot Bristle-grass). *Distr.*: Indigenous to tropical America, Chile and Argentina; introduced into U.S.A., S. Afr., Philippines, N.Z., N.S.W., Qd, W.A. and Victoria where it is a frequent widespread weed of gardens, roadsides and moist lowland pastures (e.g. Melbourne suburbs, Dandenongs, Beaconsfield, Poowong, Kongwak, Tallangatta, Mansfield, Banalla, Cobram, Tongala, Graytown, Bendigo, Cobden, Hamilton, Far North-west).

[Some Australian populations have been referred to the variety *pauciseta* Desv., but the more typical form seems to be well represented in Victoria.]

—Bristles much *exceeding* the pale spikelets; upper glume almost *covering the shiny, smooth* (or very faintly rugulose) fertile lemma (annuals) 3

3. Panicle 1-2" long; spikelets falling away *entire*, with glumes and sterile lemma attached to fertile lemma (grass 1-2 ft. high):

427. **S. viridis* (L.) Pal. Beauv. *Ess. Agrost.* 51, t. 13 fig. 3 (1812).

Panicum viride L. *Syst. Nat.* ed. 10, 2: 870 (1759).

Illust.: Palisot de Beauvois (*l.c.*); Sampson in Hubbard, *Pelican Book A* 295 (Grasses): 338 fig. 1 (1954); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1105 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 248 (1940), as "*Chatochloa viridis*"; Herter, *Flor. il. Uruguay* 1: fig. 540 (1942); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1164 (1931), as "*Panicum viride*"; Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3028, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3955 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 88 n. 2 (1907); Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 188 fig. 510, col. (1850).

Vern.: Green Pigeon-grass (Green Bristle-grass). *Distr.*: Indigenous to warm-temperate Europe, Asia and Indonesia (?); introduced into Britain, N. & S. Amer., Philippines, N.G. N.Z., all Australian States except W.A. (?) and scattered as a cultivation weed in several parts of Victoria (e.g. Beechworth, Drouin, Jeetho, Wimmera district), but complete range not known.

—Panicle 2-10" long (seldom <2"); fertile lemma becoming *detached* from rest of spikelet at maturity and falling *separately* as a false fruit (grass 2-5 ft. high):

428. **S. italica* (L.) Pal. Beauv. *Ess. Agrost.* 51 (1812).

Panicum italicum L. *Spec. Plant.* 1: 56 (1753).

Illust.: Morris in Ewart, *Flor. Vict.* fig. 42 (1931); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1107 (1951); Herter, *Flor. il. Uruguay* 1: fig. 541 (1942); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3029, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3957 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 1: fig. 88 n. 1 (1907).

Vern.: Italian Millet (Foxtail Millet). *Distr.*: A derivative of *S. viridis* (now apparently stabilized), probably originating in Central Asia but now widely distributed and cultivated throughout warmer zones of the world—e.g. Mediterranean, S. Afr., N. & S. Amer., Philippines, N.S.W., Qd, W.A. and Victoria, where occasionally persisting near crop-land (noted at Kyabram and Jeetho).

156. *PSEUDORAPHIS* W. Griffith (1851)

Stems >2 mm. wide; inflorescence a *panicle*, the branches numerous, spreading, flexuose and *all* with 2 to several spikelets; spikelet 5-6 mm. long, often purplish; fertile lemma *obtus*e, \pm 2-3 mm. long:

429. *P. spinescens* (R. Br.) J. W. Vickery in *Proc. roy. Soc. Qd* 62: 69 (1952).
Panicum spinescens R. Br. *Prodr. Flor. Nov. Holl.* 193 (1810);
Chamæraphis spinescens (R. Br.) Poir. in *Encycl. méth. Bot. Suppl.*
 2: 189 (1811).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 70 fig. B (1952), as "*Pseudoraphis abortiva*"; Morris in Ewart, *Flor. Vict.* fig. 45 (1931), as "*Chamæraphis spinescens*"; Maiden, *Agric. Gaz. N.S.W.* 11: t. opp. 721 (1900), as "*Chamæraphis spinescens*".

Vern.: Spiny Mud Grass. *Distr.*: Frequent along rivers, lagoons and low inundated ground in northern Victoria (e.g. Murray R. at Kulkyne Nat. Forest, Echuca, Nathalia, near Chiltern, Broken R., Goulburn R., Lower Mitta Mitta R.), with more isolated occurrences at Hawkesdale and on the Wimmera R. near Dimboola; inland watercourses of all States except Tas., N.G., Java, Borneo, Philippines, South China, Ceylon, India.

Stems 1-2 mm. wide; inflorescence a *raceme* or almost so (only the lower branches occasionally bearing 2 distant spikelets); spikelet 7-9 mm. long, usually green; fertile lemma *acute*, 3-4 mm. long:

430. *P. paradoxa* (R. Br.) Pilger in *Notizbl. bot. Gart. Berl.* 10: 210 (1928).
Panicum paradoxum R. Br. *Prodr. Flor. Nov. Holl.* 193 (1810);
Chamæraphis paradoxa (R. Br.) Poir. in *Encycl. méth. Bot. Suppl.*
 2: 189 (1811).

Illust.: Maiden, *Agric. Gaz. N.S.W.* 8: t. opp. 521 (1897), also *Manual Grasses N.S.W.* t. opp. 59 (1898)—both as "*Chamæraphis paradoxa*".

Vern.: Slender Mud Grass (Thorny Mud Grass). *Distr.*: Semi-aquatic and rare in Victoria, where known only by a few old collections from East Gippsland (Lake King and Snowy R. near Orbost); also N.S.W., Qd.

157. *PENNISETUM* L. C. Rich. ex Pers. (1805)

1. Inflorescence reduced to clusters of 2-4 (occasionally 1) spikelets, *almost completely enclosed* in the uppermost leaf-sheaths and rarely seen; bristles weak, shorter than spikelet (coarse matted perennial with *long-creeping* rhizomes, stout vigorous *much-branching stolons*, \pm distichous foliage, glabrous or hairy leaf-sheaths and densely ciliate ligules):

431. **P. clandestinum* Hochst. ex Chiov. in *Ann. Bot., Roma* 8: 41, t. 5 fig. 2 (1903).

Illust.: Chiovenda (*l.c.*); *J. Dep. Agric. S. Aust.* 50: 399 (1947); Hosaka, *Circ. Univ. Hawaii agric. Ext. Serv.* 389: fig. 1-4 (1958); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1114 (1951); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 369-370 (1955).

Vern.: Kikuyu Grass. *Distr.*: Indigenous to tropical E. Africa; introduced into S. Afr., Hawaii, California (where a pest in orchards and gardens), N.Z. (North Id), all Australian States (King & Flinders Is in Tas.), and in Victoria a frequent escapee from lawns on sandy ground in warmer districts (e.g. Melbourne suburbs, Queenscliff, Anglesea, Portland, Cornishtown, Lakes Entrance)—also of increasing use as a hardy, very drought-resistant pasture grass.

—Inflorescence a *long-exserted*, erect or ascending spike-like panicle with numerous spikelets (non-stoloniferous perennials) 2

2. Bristles *not or only slightly* exceeding the spikelets, minutely barbellate; panicle narrow-cylindric, 3-12" long, straw-yellow to purplish; culms robust, erect:

432. **P. macrourum* Trin. in *Mém. Acad. Sci. St. Pétersb. sér. 6 Sci. math. phys. & nat.* 3²: 178 (1834).

Illust.: Arber, *Ann. Bot., Lond.* 45: 403, 405 (1931).

Vern.: African Feather Grass. *Distr.*: Indigenous to S. Africa; introduced into N.Z. (Kaikoura), N.S.W., S.A., W.A., and western Victoria where at present confined to the Casterton district (reported as spreading rapidly there by Apr. 1958).

—Bristles much longer than (often 1" or more) and *far exceeding* the spikelets 3

3. Culms erect, 2-3 ft. high; panicle *cylindric*, 3-6" long; bristles *purple*, rigidly erect, *minutely barbellate*; spikelet \pm 6 mm. long:

433. *P. compressum* R. Br. *Prodr. Flor. Nov. Holl.* 195 (1810).

Illust.: Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. 35 opp. 375 (1891); Koorders, *Exkursionsflor. Java* 4¹: 40 (1913).

Vern.: Swamp Foxtail-grass. *Distr.*: Very localized (and perhaps not truly indigenous) in Victoria where known only from Bonang Highway at Delegate R. near the N.S.W. border (Mar. 1956); also N.S.W., Qd, Java, Japan, China, Burma—often around near-coastal swamps, but also in mountains.

—Culms ascending, rarely 2 ft. high; panicle short and broad, *ovoid* or *oblong*, 1-4" long; bristles pale *yellowish* (rarely purplish), soft, lustrous, widely spreading, delicately *plumose* toward the base; spikelet 10-12 mm. long:

434. **P. villosum* R. Br. in *Mus. Senckenb. Abh.* 2: 134 (1837).

Illust.: Everist, *Common Weeds Farm & Pasture* fig. 8 (1957); Black, *Flor. S. Aust.* ed. 2: fig. 91 (1943); Morris in Ewart, *Flor. Vict.* fig. 43 (1931); Gleason, *New Britton & Brown Ill. Flor. N.E. United States & Canada* 236 (1952); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1112 (1951); Herter, *Flor. il. Uruguay* 1: fig. 548 (1942); Bailey, *Standard Cycl. Hort.* new ed., 3: fig. 2857 (1925).

Vern.: Feathertop (Long-styled Feather Grass). *Distr.*: Indigenous to North and tropical Africa; introduced into S. Afr., N. Amer., Java, N.Z. (North Id), all Australian States except Tas., and a frequent roadside weed in western and northern Victoria (Melbourne bayside suburbs, Sorrento, Queenscliff, Bacchus Marsh, Warrnambool, Portland, Hamilton, Woomelang, Far North-west, Maryborough, Inglewood, Rochester, Kyabram, Nathalia, Toolamba,

Wangaratta), with occasional occurrences in Gippsland (e.g. Traralgon)—probably an escapee from gardens, where sometimes grown as an ornamental grass.

[*P. typhoides* (Burm.) O. Stapf & C. E. Hubbard (Pearl Millet), *P. glaucum* R. Br. being synonymous, is a large stout annual (3-6 ft.) with *very dense* cylindrical spike (4-8" long and about 1" wide). Its origin is unknown, but plants are cultivated for their grain in many warm countries. *P. typhoides* has been grown in the vicinity of Melbourne, at Bendigo, Kyabram and Swan Hill, but is nowhere spontaneous in Victoria.]

158. **CENCHRUS* L. (1753)

435. **C. pauciflorus* Benth. Bot. Voy. H.M.S. *Sulphur* 56 (1844).

C. tribuloides sens. Morris in Ewart *Flor. Vict.* 125 (1931),
atque auctt. Aust. al., non L. (1753).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 84 fig. c (1952); Flemons & Whalley, *Agric. Gaz. N.S.W.* 69: 459 fig. D (1958); Orchard, *J. Dep. Agric. S. Aust.* 51: 581 (1948), as "*C. tribuloides*"; Connell in Chippindall, *Grasses & Pastures S. Afr.* fig. 375 n. 1 (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1120 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 250 (1940); Herter, *Flor. il. Uruguay* 1: fig. 552 (1942).

Vern.: Spiny Bur-grass (Field Sand-bur—U.S.A.). *Distr.*: Probably indigenous to tropical America, but now a frequent weed of open sandy places in western U.S.A. and temperate S. Amer.; introduced into S. Afr., inland districts of all Australian States except Tas., and now a troublesome weed in many parts of the Mallee, Murray Valley and northern plains in Victoria (Murrayville, Underbool, Mildura, Hopetoun, Speed, Rainbow, Donald, Manangatang, Swan Hill, Tresco, Kerang, Echuca, Nathalia, Rochester, Chiltern, etc.).

Diagn.: Loose annual with branched culms 1-3 ft. high, ascending from \pm decumbent bases; leaf-sheaths loose, often standing away from culms; blades lax, linear, 2-10" long, 2-6 mm. wide, flat or slightly folded, smooth or minutely scaberulous (especially along the 20-30 nerves and edges); ligule a collar of cilia \pm 1 mm. high; inflorescence a spike, usually 1-3" long, often partly enclosed in uppermost leaf-sheath, the flattened rachis strongly flexuose (zigzag), each notch bearing an easily detachable, pale, spiny bur to 10 mm. wide; bur consisting of an involucre of coalescing spines (sterile branchlets) enclosing 1 or 2 sessile spikelets, the body \pm globoid, finely and loosely pubescent; spines numerous, with broad flattened bases, the free acicular portion 4-5 mm. long, spreading or decurved, microscopically and retrorsely scabrid toward apices; spikelet embedded in bur and falling intact with it, 5-7 mm. long; lower glume 1.5-3 mm. long; upper glume and sterile lemma subequal, \pm 5 mm. long, narrowly ovate, membranous, \pm hyaline but strongly 5-nerved (in green); fertile lemma 6-7 mm. long, acuminate, chartaceous, indistinctly nerved, with inrolled margins; palea \pm similar; anthers narrow-oblong, 0.5-0.8 mm. long; grain ellipsoid, smooth, 3-4 mm. long.

[The African and S.W. Asian *C. ciliaris* L. (Black Buffel-grass) had become established by June 1960, in Ouyen district, Victoria, where it was deliberately introduced by the Soil Conservation Authority. in an endeavour to check erosion. This perennial is already naturalized in several north-west districts of Western Australia (from Port Hedland to Wooramel R.), and is distinguished by having slender, plumose involucreal spines that are fused only at the extreme base—for this reason some authors treat it as a species of *Pennisetum*.]

159. ISACHNE R. Br. (1810)

436. *I. globosa* (Thunb.) Kuntze *Rev. Gen. Plant.* 2: 778 (1891).*Milium globosum* Thunb. *Flor. japon.* 49 (1784);*I. australis* R. Br. *Prod. Flor. Nov. Holl.* 196 (1810).

Illust.: Hubbard in Hutchinson, *Fam. Flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 447 (1959); Black, *Flor. S. Aust.* ed. 2: fig. 74 (1943); Morris in Ewart, *Flor. Vict.* fig. 46 (1931); Grosse in Turner, *Agric. Gaz. N.S.W.* 3: t. 14 opp. 233 (1892) also *Aust. Grasses* t. opp. 31 (1895); Bacchus, *Annu. Rep. Dep. Agric. Vict.* 2: t. 28 (1874); Buchanan, *Indig. Grasses N.Z.* t. 12 (1877); Makino, *Ill. Flor. Jap.* 817 (1924)—all except the last (Makino) as "*I. australis*".

Vern.: Swamp Millet. *Distr.*: Not uncommon in swamps and on low inundated ground along rivers in north-eastern and eastern Victoria (Goulburn, Broken & King Rivers, Murray R. near Albury, Snowy R. & Young's Ck near Orbost, Upper Cann R., Suggan Buggan), but occasional and rare in the south-west (mouth of Gellibrand R., near Portland); S.A., N.S.W., Qd, N.Z., Polynesia, N.G., Indonesia, Japan to Burma, Ceylon & E. India.

Diagn.: Slender perennial, creeping and rooting at lower nodes, the culms ascending to 1 ft. or more; leaf-sheaths often ciliate toward summit; blades narrow-lanceolate, flat, 2-3" long, 2-6 mm. wide, rough and minutely scabrid beneath, less so above, marginal nerves and 5-7 others usually very prominent; ligule a minute ring of hairs \pm 0.5 mm. high; panicle often partly enclosed by uppermost leaf-sheath, 2-4" long, to 3" wide, very broad and loose, with many filiform \pm flexuose branches; spikelets 2-flowered, isolated, plump, pedicellate, globoid to obovoid, smooth, 2-2.5 mm. long; glumes subequal to each other and spikelet, broadly ovate but blunt and cucullate, smooth, often purplish, 5- to 7-nerved, at length gaping widely; lower lemma \pm 2 mm. long, hardened, polished, with incurved margins, enclosing a bisexual or male floret; upper lemma similar, enclosing a bisexual or female floret; paleas similar; styles conspicuous, purplish, very plumose, 1-1.5 mm. long; anthers linear 1-1.5 mm. long.

160. *STENOTAPHRUM Trin. (1820)

437. **S. secundatum* (Walt.) Kuntze *Rev. Gen. Plant.* 2: 794 (1891), ut "*secundum*" in err.*Ischæmum secundatum* Walt. *Flor. Carol.* 249 (1788).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 72 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 93 (1943); Morris in Ewart, *Flor. Vict.* fig. 41 (1931); Bailey, *Ill. Monogr. Grasses Qd* 1: t. [41] (1878), as "*S. americanum*"; Hitchcock in Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 125 (1940); Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 316 (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 845 (1951); Herter, *Flor. il. Uruguay* 1: fig. 512 (1942), Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3025, col. (1930-31), as "*S. americanum*"; Coste, *Flor. Franc.* 3: fig. 3972 (1906), as "*S. americanum*".

Vern.: Buffalo Grass (St. Augustine Grass—U.S.A.). *Distr.*: Indigenous to tropical America and warmer parts of Africa (including S. Afr.); introduced into W. Eur., temperate N. & S. Amer., N.Z., N. Cal., all Australian States, and often escaping from lawns in Victoria to become spontaneous, especially on sandy coastal soils (thoroughly naturalized in parts of the Far North-west, at Nathalia, Graytown, Timboon, Anglesea, Queenscliff, Melbourne bayside suburbs, Cape Schanck, Lakes Entrance, Gabo Id, etc.).

Diagn.: Glabrous, stoloniferous perennial, extensively creeping and rooting at nodes; leaf-blades 3-9" long, 4-10 mm. wide, flat or broadly channelled, bluntish at apex, the sheaths strongly keeled, compressed, loose from culms; ligule a rim of white cilia to 1 mm. high; inflorescence a rigid, flattened, \pm fleshy, brittle spike 2-4" long, embraced by the uppermost leaf-sheath; spikelets secund, appressed to and almost embedded in the broad (4-6 mm.) rhachis, usually in pairs, rarely solitary or in 3's, each 3-5 mm. long, ovate-elliptic, pointed; lower glume 1.5 mm. long, \pm rotund, truncate, hyaline, almost nerveless; upper glume and 2 lemmas \pm equal, 4-5 mm. long, lustrous, firm, 5- to 7-nerved, the mid-nerve prominent (lower lemma usually enclosing a male floret); paleas membranous, \pm 4 mm. long; anthers linear, \pm 2 mm. long; styles conspicuous, purplish-plumose, 2-3 mm. long.

161. SPINIFEX L. (1771)

438. *S. hirsutus* Labill. *Nov. Holl. Plant. Specim.* 2: 81, tt. 230 & 231 (1806).

Illustr.: Labillardière (*l.c.*); Blake, *Aust. Encycl.* 4: 369 (1958); Watson, *Vict. Nat.* 65: 21 (1948); Black, *Flor. S. Aust.* ed. 2: fig. 94 (1943); Wood, *Veg. S. Aust.* fig. 8 & 9 (1937); Osborne, *Trans. roy. Soc. S. Aust.* 46: t. 1 (1922); Morris in Ewart, *Flor. Vict.* fig. 53 (1931); Button in *Maiden Agric. Gaz. N.S.W.* 5: tt. opp. 835 (1894), also *Manual Grasses N.S.W.* tt. opp. 60 (1898); Allan, *Bull. Dep. sci. industr. Res., N.Z.* 49: fig. 101 (1936); Buchanan, *Indig. Grasses N.Z.* tt. 8 & 9 (1877); Labillardière in Hackel, *True Grasses* (transl. Lamson-Scribner & Southworth) fig. 34 (1896).

Vern.: Hairy Spinifex (Silver Grass, Spiny Rolling Grass—S.A.). *Distr.*: Strands and outer dunes along the whole Victorian coast-line, from mouth of the Glenelg R. to Gabo Id (e.g. Port Fairy, Cape Otway region, Anglesea, Port Phillip Bay, Western Port, Corner Inlet, Lakes Entrance); temperate coasts of all States, also N.Z. & N. Cal.

Diagn.: Stout, long-creeping, sand-binding perennial of coastal shore-lines; leaf-blades silvery-silky on both sides, flaccid, 6-12" long, 4-8 mm. wide, linear, flat or involute-setaceous toward apices, the sheaths very villose above but often subglabrous at nodes; ligule a rim of dense cilia to 5 mm. long; inflorescences of clustered spikes subtended by large spathaceous bracts, hairy, straw-coloured, either male or female and strikingly dissimilar—male spikelets 8-12 mm. long, loosely hairy, in naked spikes (1-2" long) which are erect in 2-4 narrow fascicles; female spikelets similar to male, but a little narrower, solitary and sessile near base of each very long, villous, rigid, awn-like rhachis, all densely aggregated to form a large globoid, porcupine-like head to 9" wide (often breaking loose and rolling before the wind); glumes and lemmas subequal, 8-12 mm. long, acute, with membranous margins, the former 7- to 9-nerved; female palea hardened around grain; anthers large, linear, 6-9 mm. long.

[F. Mueller, in *Key Syst. Vict. Plant.* 1: 481 (1888), recorded *S. paradoxus* (R. Br., ut *Neurachne*) Benth. on the basis of specimens labelled "Murray River" and presumably collected by Dallachy (1858) or Beckler (1860). Morris in Ewart's *Flor. Vict.* 134 (1931) perpetuates the record; but it is now fairly certain that the old "Murray River" collections came from the northern side of the river—perhaps well inland toward Traveller's Lake (50 miles N. of Wentworth, N.S.W.), where the species is known to occur. During almost a century no one has observed Cane Spinifex or Sandhill Cane-grass—the correct binomial now being *Zygochloa paradoxa* (R. Br.) S. T. Blake—in Victoria. This glabrous, rigid, sand-binding perennial

has long, naked, branched culms, spikelets in irregular heads about 1.5 cm. wide, and it inhabits the more arid loose-sandy parts of South and Central Australia, New South Wales and Queensland.

At least four other species in the tribe *Paniceæ* have appeared occasionally in Victoria, but are not known to be naturalized and spontaneous. Of these, the South African silky-headed *Rhynchelytrum repens* (Willd., ut *Saccharum*) C. E. Hubbard (Red Natal Grass or Natal Red-top) was recorded by Morris in Ewart's *Flor. Vict.* 133 (1931) under the name *Tricholæna teneriffæ* (R. Br.) Parlat.—applicable to a very different Mediterranean and West African species. The only collection from Victoria in Melbourne Herbarium is labelled "Mortlake, Apr. 1916", and evidence is lacking that *R. repens* is spontaneous either there or anywhere else in the State; it is certainly well established in New South Wales (e.g. suburbs of Sydney), Queensland and a few parts of Western Australia. *Brachiaria miliiformis* (C. Presl) A. Chase (Two-spiked Panic) is a slender glabrous annual indigenous to inland parts of all mainland States except Victoria, where it appeared at Rochester in Apr. 1930; but its establishment so far south would seem unlikely. The tropical American *Axonopus compressus* (Sw., ut *Milium*) Pal. Beauv. (Carpet Grass), a glabrous long-stoloniferous perennial, has been found occasionally at Echuca, and in lawns around Melbourne; it was first cultivated about 1921, and is recorded as naturalized in New South Wales and Western Australia. Indian *Urochloa panicoides* Pal. Beauv. (Liverseed Grass) is also naturalized in New South Wales; it was cultivated in Victoria for fowl feed at Burnley and Riddell in Mar. 1945, but has apparently not persisted.]

Tribe ANDROPOGONEÆ

162. HEMARTHRIA R. Br. (1810)

439. *H. uncinata* R. Br. *Prodr. Flor. Nov. Holl.* 207 (1810).

Rottboellia compressa sens. Morris in Ewart *Flor. Vict.* 114 (1931),
atque auctt. Aust. plur., non L.f. (1781).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 89 fig. B (1952); Black, *Flor. S. Aust.* ed. 2: fig. 54 (1943); Morris in Ewart, *Flor. Vict.* fig. 34 (1931), as "*Rottboellia compressa*"; Lang & Eckert in Luehmann, *J. Dep. Agric. Vict.* 1: t. opp. 719, col. (1902), as "*Rottboellia compressa*"; Wills in Turner, *Agric. Gaz. N.S.W.* 3: t. 34 opp. 539 (1892), also *Aust. Grasses* t. opp. 28 (1895)—both as "*H. compressa*".

Vern.: Mat Grass. *Distr.*: Around swamps and on wet creek- or river-flats throughout the cooler parts of Victoria, usually on heavy clay-soils, but not in the alps (e.g. Lower Glenelg, Yarra, Jamieson, Ovens, Upper Murray, Suggan Buggan & Delegate Rivers, Ballarat district, Winchelsea, Melbourne area, Tooradin, Wilson Prom., Toongabbie, Maffra, Lakes Entrance, Tawonga); similar situations in temperate parts of all States.

Diagn.: Stiff, ascending, \pm glabrous perennial to about 1 ft. high (rarely more); leaf-blades narrow linear, flat, but keeled, acuminate, 2-8" long, 2-4 mm. wide, the lowermost sheaths sometimes sprinkled with short hairs; ligule a minute fringe of cilia \pm 0.5 mm. high; inflorescence a solitary, rigid but rather brittle and readily fragmenting, \pm compressed (and at first terete) spike 2-5" long and 2-4 mm. wide; spikelets in pairs, green, glabrous, 7-10 mm. long, sessile and closely appressed to spike in 4 rows (or sometimes distichous), 1-flowered; glumes subequal, 7-10 mm. long, hard, coriaceous, lanceolate, acuminate, faintly 5- to 7-nerved, the upper slightly longer and often curved or sharply hooked at its apex; sterile lemma, fertile lemma and palea similar, \pm 5 mm.

long, narrow-oblong, obtusish, delicate, hyaline, almost nerveless; anthers linear, purplish, 3 mm. long; styles conspicuous, with penicillate ends 3 mm. long.

163. *IMPERATA* Cyrillo (1792)

440. *I. cylindrica* (L.) Pal. Beauv. *Ess. Agrost.* 8, t. 5 fig. 1 (1812).

Lagurus cylindricus L. *Syst. Nat.* ed. 10, 2: 878 (1759).

Illust.: Palisot de Beauvois (*l.c.*); Gardner, *Flor. W. Aust.* 1^a (Gramineæ): t. 92 fig. B (1952), as "*I. cylindrica* var. *koenigii*"; Black, *Flor. S. Aust.* ed. 2: fig. 52 (1943); Morris in Ewart, *Flor. Vict.* fig. 31 (1931); Lang & Eckert in Luehmann, *J. Dep. Agric. Vict.* 1: t. opp. 718, col. (1902), as "*I. arundinacea*"; Grosse in Turner, *Agric. Gaz. N.S.W.* 4: t. 2 opp. 2 (1893), also *Aust. Grasses* t. opp. 30 (1895)—both as "*I. arundinacea*"; Bacchus, *Annu. Rep. Dep. Agric. Vict.* 2: t. 26 (1874), as "*I. arundinacea*"; Letty in Chippindall, *Grasses & Pastures S. Afr.* fig. 392 (1955), as "*I. cylindrica* var. *africana*"; Poinsoy in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3051, col. (1930–31); Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 173 fig. 455, col. (1850).

Vern.: Blady Grass (Kunai, Kogo, Kura Kura, Cogon Satin-tail—U.S.A.). *Distr.*: Widely distributed and rather common on poor and sandy soils in many parts of Victoria—excepting the Mallee, northern plains, mountain-forests and alps—frequently coastal (e.g. Lower Glenelg R., Harrow, Dimboola, Stony Rises near Colac, Bellarine Penins., Port Phillip Bay, Dandenongs, Phillip Id, Wilson Prom., Lakes Entrance, Bruthen, Buchan, Cann R., Howe Ranges & Gabo Id, Upper Gezoa R., Suggan Buggan, Upper Murray R., Mitta Mitta R., King R., Broken R.); all States, N.Z. (near Auckland where perhaps introduced), N. Cal., N.G. to Malaysia, trop. Asia, China & Japan, but introduced in S. Afr.

Diagn.: Stiffly erect perennial 1-3 ft. high, almost glabrous except for a tuft of hairs often present at nodes; leaf-blades 2-12" long, 4-6 mm. wide, linear, acuminate with thinner scabrid margins, erect when young but often drooping at ends when old, often vividly yellow-green; ligule a hyaline rim fringed with cilia 1-3 mm. long, the summit of sheath ± auriculate; panicle narrow, dense and spike-like, regularly cylindrical, silky-white, 3-8" long, 1-2 cm. wide; spikelets almost hidden by long silky hairs of glumes, 1-flowered, in pairs, unequally pedicellate, 3-4 mm. long, lanceolate; glumes equal, membranous 3-4 mm. long, invested on the back with fine hairs to 10 mm. long, the lower 5- to 7-nerved, upper 3- to 5-nerved; sterile lemma, fertile lemma and palea delicate, hyaline, the lemmas ± 2 mm. long, palea 1 mm. long with truncate torn apex; anthers orange-yellow, narrow-oblong to linear, ± 3 mm. long; penicillate style-ends 2-3 mm. long.

[Australian and S. E Asian populations are referable to the var. *major* (Nees) C. E. Hubbard in Hubbard & Vaughan *Grasses of Mauritius and Rodriguez* 96 (1940), with distribution as indicated above and differing from the typical form in its villous nodes, rather flaccid leaves and small anthers (2-3 mm. long). Other variants of *I. cylindrica* range through Mediterranean countries, W. Asia, tropical and warm-temperate Africa, and perhaps warm-temperate S. America.]

164. *EULALIA* Kunth (1829)

441. *E. fulva* (R. Br.) Kuntze *Revis. Gen. Plant.* 2: 775 (1891).

Saccharum fulvum R. Br. *Prod. Flor. Nov. Holl.* 203 (1810);

Pollinia fulva (R. Br.) Benth. *Flor. aust.* 7: 526 (1878), *non* Spreng. (1821).

Illust.: Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 93 fig. A (1952); Black, *Flor. S. Aust.* ed. 2: fig. 53 (1943); Morris in Ewart, *Flor. Vict.* fig. 32 (1931); Grosse in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 96 (1923); Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. 34 opp. 373 (1891), also *Aust. Grasses* t. opp. 47 (1895)—all, except Gardner and Black, as "*Pollinia fulva*".

Vern.: Silky Browntop (Sugar Grass). *Dist.*: In Victoria confined to the Murray and Goulburn Valleys, usually on sandy ground prone to inundation, and uncommon (Far North-west, Echuca, Mooroopna, Gooramadda, a specimen labelled "Wimmera" in Melbourne Herbarium being of dubious origin); inland parts of all States except Tas., Cent. Aust., Indonesia, Philippines, China, E. India.

Diagn.: Tall, tussock-forming perennial, often \pm glaucous, almost glabrous (except inflorescence); leaf-blades flat, 2-6" long, 3-5 mm. wide, linear-lanceolate, acuminate; ligule truncate, hyaline, 1-2 mm. high, the orifice of sheath sometimes ciliate; racemes 2-4, sessile and subdigitate at apex of culm, each 1-3" long, reddish-brown and shining from the long silky hairs of glumes; spikelets densely arranged, in pairs (lower sessile, upper stalked), both fertile and awned, \pm 5 mm. long (excluding awns); glumes subequal, \pm 5 mm. long, truncate, faintly nerved, \pm keeled, densely villous with reddish-brown or golden hairs of almost equal length to spikelet; sterile lemma minute or absent; fertile lemma hyaline, bifid and inconspicuous (1-2 mm. long) except for its slender terminal awn; awn 10-15 mm. long, golden, twisted, irregularly geniculate; palea minute or absent; anthers reddish-purple, linear, 3-4 mm. long; penicillate part of styles 3-4 mm. long.

165. SORGHUM Moench (1794)

Nodes *glabrous* or almost so; leaf-blades >5 mm. (and up to 15 mm.) wide; spikelets on *short glabrous* pedicels, pubescent with *short, white, appressed* hairs or almost glabrous:

442. **S. halepense* (L.) Pers. *Synops. Plant.* 1: 101 (1805).

Holcus halepensis L. *Spec. Plant.* 2: 1047 (1753).

Illust.: Everist, *Common Weeds Farm & Pasture* fig. 12 (1957); Black, *Flor. S. Aust.* ed. 2: fig. 55 (1943); E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 102 (1923); Wills, *J. Dep. Agric. S. Aust.* 10: 842 (1907); Wills in Maiden, *Agric. Gaz. N.S.W.* 7: t. opp. 78 (1896), also *Manual Grasses N.S.W.* t. opp. 87 (1898); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 377 (1955); Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1177 (1951); Gill in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 221 (1940); Herter, *Flor. il. Uruguay* 1: fig. 577 (1942); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 3048, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3979 (1906); Reichenbach, *Icon. Flor. germ.* 1, ed. 2: t. 175 fig. 464, col. (1850).

Vern.: Johnson Grass (Aleppo Grass, Evergreen Millet). *Dist.*: Indigenous to the Mediterranean region; widely planted as a fodder grass and naturalized throughout warmer regions of both hemispheres, including all mainland States of Australia, but in Victoria almost confined to irrigation districts of the Murray and Goulburn Valleys where frequent (e.g. Red Cliffs, Kerang, Rochester, Stanhope, Shepparton, Cobram, Tallangatta), sometimes becoming a troublesome weed on cultivated ground.

[Johnson Grass can be highly cyanogenetic, and poisonous to stock, under certain conditions of growth—e.g. after sudden vigorous growth.]

Nodes *prominently bearded* with long white silky hairs; leaf-blades <5 mm. wide; spikelets on *long hairy* pedicels, beset toward base with a tuft of *long, yellow-brown, ± spreading* hairs (grass of East Gippsland):

443. *S. leiocladum* (Hack.) C. E. Hubbard in *Hook. Icon. Plant.* 34: t. 3364 (1938).

Andropogon australis Spreng. subsp. *leiocladus* Hack. in *DC. Monogr. Phan.* 6: 524 (1889).

Illust.: Ross-Craig in Hubbard (*l.c.*); Grosse in Turner, *Agric. Gaz. N.S.W.* 1: t. opp. 311 (1890), *l.c.* 3: t. 2 opp. 3 (1892), also *Aust. Grasses* t. opp. 49 (1895)—all three as "*S. plumosum*".

Vern.: Wild Sorghum. *Distr.*: Confined in Victoria to a few hilly localities of East Gippsland and rare (e.g. Buchan and Ingeegoodbee R. on the border of N.S.W.); but more frequent on the neighbouring Monaro tableland in N.S.W. (inhabiting both wet and dry sclerophyll forests dominated by stringybark-peppermint eucalypts, and montane savannah woodlands of sallee eucalypts), extending to New England tablelands and into Queensland (at least to the northern part of Port Curtis district).

[The Old World *S. vulgare* Pers. (Grain Sorghum) is a tall stout annual with very dense inflorescence, persistent panicle-branches and rotund shiny spikelets. It has many cultivated varieties, including Sudan Grass—var. *sudanense* (Piper) Hitchc.—and is grown occasionally in warmer parts of Victoria, although nowhere becoming spontaneous. L. H. Shinnars in *Baileya* 4⁴: 141 (1956) points out the illegitimacy of the name *S. vulgare* Pers.]

B. macro

166. BOTHRIOCHLOA Kuntze (1891)

444. *B. ambigua* S. T. Blake in *Pap. Dep. Biol. Univ. Qd* 2³: 29 (1944).

Andropogon pertusus sens. Morris in Ewart *Flor. Vict.* 116 (1931), non Willd. (1806).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 57 (1943), as "*B. decipiens*"; Morris in Ewart, *Flor. Vict.* fig. 35 (1931), as "*Andropogon pertusus*".

Vern.: Red-leg Grass (Pitted Beard Grass). *Distr.*: Open plain country and drier lowland pastures almost throughout Victoria, but the range undoubtedly much extended during the past half-century when it has spread into southern parts of the State, excepting the S.W. (Hopetoun, Sunbury, Lilydale district, Seymour, Kilmore, Nathalia, Beechworth, Wodonga, Tallangatta, Suggan Buggan, Deddick, Buchan district); S.A. (rare), N.S.W. (frequent in Albury region and Riverina), Qd (southern).

Diagn.: Slender perennial 1-2 ft. high, glabrous except for inflorescence, the culms often reddish-purple and toughish; leaf-blades linear, 2-8" long, 2-5 mm. wide, flat, acuminate; ligule a torn hyaline rim 1-2.5 mm. high; racemes 2-5, erect, clustered at apex of culm but not truly digitate, very shortly stalked, sometimes purplish, each 1-3" long; spikelets in pairs, a sessile one awned and bisexual, a neuter one awnless and with pedicel ± 4 mm. long (neuter consisting of a single 7-nerved glume, 3-4 mm. long, with villous hairs around base and on pedicel); sessile spikelet 5-7 mm. long, villous-bearded at base, otherwise almost glabrous; lower glume as long as spikelet, flattish, shortly acute, ± 5- to 7-nerved between the 2 obscure keels, with or without a deep pit at centre of upper third, coriaceous; upper glume similar but paler, ciliate in upper part, strongly keeled, almost nerveless; sterile lemma hyaline, nerveless, 3-4

mm. long; fertile lemma 2-3 mm. long, inconspicuous, hyaline, supporting a terminal slender awn; awn brownish, \pm bigeniculate, 15-20 mm. long, readily deciduous; palea minute or absent; anthers purplish, 1-1.5 mm. long.

[The record of tropical *B. erianthoides* (F. Muell.) C. E. Hubbard, as a naturalized grass, was perpetuated (under *Andropogon erianthoides*) by Morris in Ewart's *Flor. Vict.* 117 (1931), despite a letter in Melbourne Herbarium from E. E. Pescott (31/8/1915) correcting this fallacy—the sole origin of the record was a specimen in C. Walter's collection labelled "Shepparton, Dec. 1900", and this came from a plant grown for ornament in Mr. Pescott's own garden at Shepparton. The species has never persisted, much less spread, in that district.]

167. *DICHANTHIUM* Willemet (1796)

445. *D. sericeum* (R. Br.) A. Camus in *Bull. Mus. Hist. nat., Paris* 27: 549 (1921).

Andropogon sericeus R. Br. *Prodr. Flor. Nov. Holl.* 201 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 59 (1943); Grosse in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 99 (1923); Grosse in Turner, *Agric. Gaz. N.S.W.* 1: t. opp. 309 (1890), also *l.c.* 2: t. 63 opp. 717 (1891); Bailey, *Ill. Monogr. Grasses Qd I*: t. [4] (1878)—all except Black as "*Andropogon sericeus*".

Vern.: Silky Blue-grass (Queensland Blue Grass). *Distr.*: Scattered in open dry pastures and rocky terrain through central, western, north-eastern and far eastern Victoria, but absent from Mallee and alps and nowhere common (Wimmera region, Creswick, Little R. near You Yangs, Sydenham, Broadmeadows, Shepparton, Suggan Buggan, Deddick); inland parts of all States except Tas., Cent. Aust., N.G., N.Cal., Philippines.

Diagn.: Somewhat glaucous, tufted perennial 1-2 ft. high; nodes of pale culms densely bearded with white silky hairs 2-3 mm. long; leaf-blades 1-4" long, 2-4 mm. wide, flat, acuminate, \pm glaucous, glabrous or sprinkled with hairs on under-surfaces and sheaths; ligule hyaline, truncate, 1-2 mm. high; racemes 2-6, sometimes nodding, sessile and digitate at summit of culm, each 1-2" long and conspicuously villous; spikelets in pairs, the awned one sessile and bisexual, the awnless one neuter and on a pedicel 2-3 mm. long, both 4-5 mm. long and fringed near margins with silky hairs 3-5 mm. long; lower glume of sessile spikelet oblong, \pm 4 mm. long, coriaceous, 5- to 9-nerved between the 2 obscure keels, villous and with hair-tuft on callus; upper glume subequal but narrower, strongly keeled and almost glabrous; sterile lemma narrow, hyaline, nerveless, 2-3 mm. long; fertile lemma consisting almost entirely of a dark, twisted, irregularly bigeniculate awn 20-30 mm. long; anthers oblong, 0.5-1 mm. long; lower glume of pedicellate spikelet 4 mm. long, oblong, villous, \pm coriaceous, many-nerved, the upper glume about half as long and 3-nerved, the lemmas usually undeveloped.

[No Victorian specimens of *D. affine* (R. Br.) A. Camus are in existence, and the recording of this Queensland grass by Morris in Ewart's *Flor. Vict.* 116 (1931) doubtless resulted from a mis-identification of *D. sericeum*.]

168. *CYMOPOGON* Spreng. (1815)

Inflorescence >6" long, with very remote divisions along culm; racemes slender, <2 mm. wide, glabrous, soon sharply deflexed, the axis fragile and readily breaking away between the acuminate spikelets (harsh cane-like grass of dryish rocky terrain in east and north-east):

446. *C. refractus* (R. Br.) A. Camus in *Rev. Bot. appl.* 1: 290 (1921).

Andropogon refractus R. Br. *Prodr. Flor. Nov. Holl.* 202 (1810).

Illust.: Grosse in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 100 (1923); Grosse in Turner, *Agric. Gaz. N.S.W.* 2: t. 40 opp. 439 (1891), also *Aust. Grasses* t. opp. 7 (1895); Bailey, *Ill. Monogr. Grasses Qd 1*: t. [3] (1878)—all as "*Andropogon refractus*".

Vern.: Barb-wire Grass (Turpentine Grass). *Distr.*: Usually on rocky terrain along water-courses in north-eastern and far eastern Victoria, but locally common (Mitta Mitta, Orbost district, Upper Cann R. at Noorinbee North, W Tree, Suggan Buggan, Deddick); wet and dry sclerophyll forests, savannah woodland and dry scrub formations in the Monaro region of N.S.W., extending northward into Queensland, also N. Cal. & Polynesia.

Inflorescence <6" long, rather compact and spike-like; racemes >5 mm. wide, densely villous all over with white silky hairs which conceal the spikelets, at maturity \pm deflexing, the axis not readily disarticulating (rare \pm robust grass of the Mallee):

447. *C. obtectus* S. T. Blake in *Pap. Dep. Biol. Univ. Qd* 2³: 55 (1944).

Illust.: Turner, *Agric. Gaz. N.S.W.* 3: t. 51 opp. 855 (1892), also *Aust. Grasses* t. opp. 4 (1895) and *J. Dep. Agric. W. Aust.* 13: 64 (1906)—all as "*Andropogon bombycinus*".

Vern.: Silky-heads. *Distr.*: Extremely rare in Victoria where known by only two collections, viz. near Dimboola (Apr. 1883) and the Murray R. (Dec. 1887)—presumably near Mildura—and probably now extinct; on sandy tracts in the interior of all mainland States, also Cent. Aust.

169. THEMEDA Forsk. (1775)

448. *T. australis* (R. Br.) Stapf in *Prain Flor. trop. Afr.* 9: 420 (1919).

Anthistiria australis R. Br. *Prodr. Flor. Nov. Holl.* 200 (1810);

T. triandra sens. Morris in Ewart *Flor. Vict.* 114 (1931), non certe Forsk. (1775).

Illust.: Blake, *Aust. Encycl.* 4: 370 (1958); Gardner, *Flor. W. Aust.* 1¹ (Gramineæ): t. 100 (1952); Black, *Flor. S. Aust.* ed. 2: fig. 62 (1943); Morris in Ewart, *Flor. Vict.* fig. 33 (1931), as "*T. triandra*"; E. F. P. in Breakwell, *Grasses & Fodder Plant. N.S.W.* fig. 98 (1923), as "*Anthistiria ciliata*"; Lang & Eckert in Luehmann, *J. Dep. Agric. Vict.* 1: t. opp. 720, col. (1902), as "*Anthistiria australis*"; Grosse in Gorman, *Agric. Gaz. N.S.W.* 16: t. opp. 1033 (1905), as "*Anthistiria ciliata*"; Grosse in Turner, *Agric. Gaz. N.S.W.* 1: t. opp. 309 (1890), *l.c.* 3: t. 1 opp. 3 (1892), also *Aust. Grasses* t. opp. 9 (1895)—all as "*Anthistiria ciliata*"; Bacchus, *Annu. Rep. Dep. Agric. Vict.* 2: t. 27 (1874), as "*Anthistiria australis*"; Fitch in Hooker f., *Flor. Tasm.* 2: t. 156, col. (1859), as "*Anthistiria australis*".

Vern.: Kangaroo Grass. *Distr.*: With the exception of Mallee sand-hills and salt-bush plains, wet mountain-forests and the alps (where virtually absent), a very widespread and abundant grass throughout Victoria; all States, Cent. Aust., N. Cal., N.G., Philippines, S. E. Asia, introduced and scattered in N.Z. and (?) West Indies.

Diagn.: Erect, glabrous, tussock-forming perennial with culms to 3 ft. high; leaf-blades narrow-linear, \pm flaccid, to 1 ft. long, 2-3 mm. wide, flat but keeled beneath and with slightly revolute margins that are \pm hyaline, often minutely

scaberulous above, the lower sheaths sometimes hairy and auricles usually ciliate; ligule extremely short (<0.5 mm.), ciliolate; panicle loose, interrupted, often nodding, 4-8" long, sometimes purplish; spikelets in aggregates of 7 (4 equal barren spikelets forming a stalked involucre around a group of 3 others, of which the lateral pair are pedicellate and male or empty, only the central sessile one being awned and bisexual), each cluster subtended by a spathe-like bract 1-4" long; barren involucral spikelets 10-12 mm. long, lanceolate, acuminate, villous below common stalk, consisting of a firm opaque lower glume (9- to 11-nerved between the 2 hyaline keels), a hyaline upper glume and hyaline lemma that often subtends a male floret; rhachis of 3 central spikelets invested with golden-brown silky hairs; paired lateral spikelets similar to those of involucre but rather narrower, on pedicels 2-3 mm. long; central sessile spikelet composed of—lower obtuse glume 5-10 mm. long, rounded on back, pale, shining, very finely 7-nerved, glabrous except for erect brownish hairs in the upper third; upper glume equal, almost glabrous, with tightly inrolled margins; lemmas shorter, linear acuminate, hyaline; awn massive, brown, pubescent, twice bent, 4-7 cm. long; callus brown-villous; anthers linear, orange-red or purplish, 6-7 mm. long; style-ends dark purple.

[The recording for Victoria of *T. avenacea* (F. Muell.) Hackel by Morris in Ewart's *Flor. Vict.* 114 (1931) is not substantiated by any collection from this State in Melbourne Herbarium. It is a tropical or subtropical species, distinguished from *T. australis* by the densely brown-pubescent fertile spikelets, and does not occur within hundreds of miles of the Murray River whence recorded (*l.c.*), probably as the result of a mis-identification.]

Tribe MAYDEÆ

170. ZEA L. (1753)

449. *Z. mays* L. *Spec. Plant.* 2: 971 (1753).

Illust.: Martin, *Qd agric. J.* 86: 158-59 (1960); *J. Dep. Agric. Vict.* 20: 612 (1922); Laurence in Chippindall, *Grasses & Pastures S. Afr.* fig. 420-21 (1955); M.W.G. in Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 1199 (1951); Anderson, *The Corn Plant of Today* tt. 1-9 (1949); Herter, *Flor. il. Uruguay 1*: fig. 597 (1943); Bailey, *Standard Cycl. Hort.* new ed. 3: fig. 4034-36 (1925); Poincot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2989, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3910 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur. 1*: t. 22 fig. 1, col. (1907); Bostelmann, *Nat. geogr. Mag.* 96: 154, col. (1949); Kavanagh in *Agric. Gaz. N.S.W.* 72¹: cover, col. (Jan. 1961); Blake & Roff, *Honey Flor. S.-E. Qd* tt. 150, 151 (1959).

Vern.: Maize (Indian Corn). *Distr.*: Cultivated in America from prehistoric times and place of origin uncertain, but probably the Mexican Plateau; now a widely grown crop and fodder plant throughout well-watered warmer parts of both hemispheres, including N.Z. and all Australian States. Rich alluvial soils on river- and creek-flats (particularly in East Gippsland) provide most of the maize crops grown in Victoria, but the species does not persist long or become truly spontaneous anywhere.

Diagn.: Tall robust annual (sometimes attaining 7-10 ft.), with culms often 1-2" wide, often developing suckers and aerial brace-roots toward the base; leaf-blades distichous, usually 10-20" long, 1-2" wide, linear-lanceolate, acuminate, flat, glabrous, with bold strong mid-nerve, ribbed overlapping sheaths and often undulate margins; ligule a hyaline, minutely ciliate collar 2-4 mm. high; male inflorescence a large terminal panicle (6-12" or more in height) with long

narrow primary branches; female inflorescence in a lower leaf-axil, forming a thick spike (4-9" long) complete encased in broad foliaceous bracts (except for the protruding tassel of many long, filiform styles or "silks"); male spikelets in pairs, one almost sessile but the other on a downy pedicel 2-4 mm. long, otherwise similar, 2-flowered, 8-12 mm. long, shortly pointed; male glumes equal, often purplish, 8-12 mm. long, 5-nerved between the 2 prominent keels, ciliolate on margins; lemmas almost as long as glumes, hyaline, faintly nerved; paleæ shorter; anthers oblong, 5-6 mm. long, 1.5 mm. broad; female spikelets sessile in 8-16 (or even to 30) compact vertical rows on a very thick rhachis, the floral envelope consisting of 2 short broad glumes, 2 lemmas and 2 paleæ which remain as chaff on the ripened cob; style single, undivided, filiform and very long (to 6"); grain typically obovoid and very flattened with convex or indented summit, yellow to reddish-black, to 15 mm. long and 5-10 mm. wide.

Family 41. CYPERACEÆ

1. Large tussock of swampy heathlands; leaf-blades narrow-linear, very long and wiry; culm rigid, leafless, 3-6 ft. high, terminating in a *single dense, globular head* (1-2 cm. wide) with very numerous 2-flowered spikelets (\pm 5 mm. long); glumes 6-8, broad, obtuse, toughened; hypogynous bristles 3, short and slender 185. *Gymnoschænus*
 Small alpine tussocks; leaf-blades stiff, narrow-linear, 3-9" long; culm 2-12" high, with loose terminal cluster of up to 12 narrow, erect, 1-flowered spikelets (each 1-2 cm. long); glumes \pm 4, hyaline-chaffy, acuminate; hypogynous bristles 6, *plumose with silky hairs*, 1-1.5 cm. long 176. *Carpha*
 Low matted or cushion-forming perennials of alpine bogs; leaf-blades rigid (almost horny), to 3" long, often distichous; culms to 1" high, with single (rarely 2-4) 1-flowered spikelet; glumes 3, narrow, to 10 mm. long, the lowermost usually leaf-like and much exceeding the other 2; hypogynous scales 6, lanceolate, 1-2 mm. long, *persisting after glumes and nut have fallen* 187. *Oreobolus*
 Habit and inflorescence not as above 2
2. All the flowers in each spikelet (and often in each spike) *unisexual*; glumes spirally arranged around the rhachilla 15
 All the flowers (or the solitary flower) in each spikelet *bisexual*, or sometimes the uppermost or lowermost flowers male only (nut never enclosed in a utricle) 3
3. Glumes all *spirally arranged* around the rhachilla (occasionally reduced to 3 in 1-flowered spikelets) 6
 Glumes manifestly *distichous* (in 2 opposite rows and usually flattened on their sides), sometimes 2 only present in 1-flowered spikelets) 4
4. Style *thickened* and scabrous in the lower part which persists as a distinct appendage or beak on the nut; culms 8-18" long, exceedingly slender (almost capillary) \pm 0.3 mm. wide; spikelets 1- or 2-flowered, few (up to 8), narrow, 4-6 mm. long, in a short, loose terminal panicle 180. *Tetraria*
 Style not thickened at base 5

5. Spikelet <6-flowered, and usually with only 1-3 flowers (when 1-flowered, then the spikelet either solitary or few together and glumes >2); rhachilla *strongly flexed* (zig-zag fashion) in all spikelets with >2 flowers; hypogynous bristles or scales occasionally present; style-arms always 3, sometimes \pm plumose 179. *Sclænus*
Spikelets >6-flowered (except in one 1-flowered species which has many minute spikelets in a dense green globose head, 2 glumes per spikelet and bifid styles); rhachilla *straight or slightly flexuose*; no hypogynous bristles or scales 171. *Cyperus*
6. Each spikelet producing only 1 (rarely 2) mature nut, rarely with all flowers bisexual; culm always with >1 spikelet 10
Each spikelet maturing >3 nuts, all the flowers bisexual; culm sometimes bearing a solitary terminal spikelet 7
7. Style swollen and thickened at the base 9
Style slender throughout, never swollen toward base 8
8. Hypogynous scales absent or consisting of 3-6 retrorsely barbellate bristles; style-arms 2 or 3 (annuals or perennials, sometimes tall) 173. *Scirpus*
Hypogynous scales 2, large and hyaline, almost enclosing the linear-oblong nut; style-arms 2 (small annual of northern rivers, with \pm filiform leaves) 172. *Lipocarpa*
9. Plant *leafless*; culm with a single terminal erect spikelet; thickened style-base remaining *attached* to nut 174. *Eleocharis*
Plant *leafy*; culm bearing a simple or compound umbel of spikelets; style articulate, *falling* as a whole from the nut 175. *Fimbristylis*
10. Hypogynous bristles or scales absent 13
Hypogynous bristles or scales present 11
11. Style not thickened at base; hypogynous scales 6, minute, at very base of nut (culms filiform, rush-like, to 1 ft. high; leaves reduced to sheathing scales with subulate points; inflorescence terminal, of 1-3 short broad spikelets) 184. *Tricostularia*
Style-base thickened and persistent on the nut; hypogynous scales or bristles conspicuous, sometimes as long as nut 12
12. Hypogynous scales 6, becoming thick and dilated (toward base) under the maturing ovoid nut; stamens 3; style-arms 3 (genus represented in every part of State; culms from filiform to broad, flat and knife-like) 183. *Lepidosperma*
Hypogynous bristles 4-6, filiform, 6-10 mm. long; nut very narrow, 1-2 cm. long (including the long-acuminate style-base); stamens usually 2; style-arms 2 (genus occurring only in extreme east of State; culms terete but \pm channelled, 1-3 ft. high; spikelets rather few, large and narrow, in an elongated panicle) 177. *Cyathochaeta*
Hypogynous bristles 6, rather longer than the small obovate nut; stamens usually 3; style-arms 2 (genus occurring only in far north-east of State; culms angular, 1-2 ft.; spikelets small, numerous, clustered in irregular corymbs on a loose, branched inflorescence) 178. *Rhynchospora*
13. Culms slender, wiry, *repeatedly branched and leafless* (the divisions often curved or flexuose); spikelets solitary or in pairs at ends of branches 186. *Causitis*

- Culms undivided *or* with few leafy branches; spikelets >2 , in terminal inflorescences 14
14. Nut with persistent, thickened style-base *or*, if otherwise, then the culms of soft texture; leaves *never* with scabrid cutting surfaces (but sometimes rigidly denticulate on margins and keel); the *lower* floret fertile in spikelets with 2 or more flowers 181. *Cladium*
- Nut rounded at apex, without persistent style-base *or*, if occasionally otherwise, then either the very long leaves *sharply scabrid* on their surfaces *or* leaf-sheaths woolly at the orifice (in a small desert plant); culms always rigid and of hard texture; the *terminal* floret fertile in spikelets having 2 or more flowers 182. *Gahnia*
15. Leaves and culms similar, soft, terete and rush-like; inflorescence a dense, globular blackish head lateral to the long involucre bract; nut *not enclosed in a utricle* 188. *Chorizandra*
- Leaves and culms dissimilar, the former grass-like; inflorescence never a lateral globular head; nut *enclosed in a flask-like utricle* 16
16. Utricle with a long-projecting *hooked* awn or bristle; flowers in a single terminal spikelet 189. *Uncinia*
- Utricle *without* a projecting awn or bristle; flowers in one or, more often, several spikelets 190. *Carex*

Tribe CYPEREÆ

171. CYPERUS L. (1753)

1. Leaf-blades *present*, normal and often grass-like 3
 —Leaves *reduced to membranous sheaths*, at base of \pm cylindrical culms 1-4 ft. high; involucre bracts 3-8, straight and rigid; rachilla of spikelet persistent; glumes 2-2.5 mm. long, pale to chestnut brown, with whitish hyaline margins (inland sedges) 2
2. Culm *prominently striated*, 3-angled at very top; bracts $<2''$ long, tough, very rigid, with incurved margins and *almost spine-tipped*; inflorescence *very congested*, forming a single dense *head* or with 1-4 secondary and shortly pedunculate globose heads; spikelet squat, <6 mm. long:
450. *C. gymnocaulos* Steud. *Synops. Plant. glumac.* 2: 12 (1855).
Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 194 (1943).
Vern.: Spiny Flat-sedge. *Distr.*: Abundant near water, especially on sandy ground, in the warmer lowland tracts of western, northern and north-eastern Victoria (e.g. Far North-west including Hattah Lakes, Wyperfeld Nat. Park, Lake Hindmarsh, Nhill, Dimboola, St. Arnaud, Kerang, Bendigo, Nathalia, Shepparton, Waggarandall near St. James); all mainland States, Cent. Aust.
- Culm *faintly and finely striate*, cylindrical throughout; bracts $>3''$ long, flat, acute but *hardly spinescent*; inflorescence a short (but open) simple or compound umbel; spikelet narrow, >7 mm. long:

451. *C. vaginatus* R. Br. *Prodr. Flor. Nov. Holl.* 213 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 193 (1943).

Vern.: Flat-sedge (Stiff Leaf-rush). *Distr.*: Known with certainty in Victoria only by a single collection from Lake Lalbert near Swan Hill (Nov. 1853), and apparently very rare if still present in the State, but possibly overlooked because of its close relationship and appearance to the common *C. gymnocaulos*; all mainland States, Cent. Aust.

3. Involucral bracts 2 to several

5

—Involucral bract *single*; spikelets *very flattened*, oblong or linear, green to pale brownish, with *persistent rhachillas* (delicate grass-like plants up to 6" high)

4

4. Annual; leaves and bracts *filiform*, the latter <2 cm. long (often <1 cm.); spikelets 1-4 in a *single lateral cluster*; glumes *obtuse*:

452. *C. tenellus* L. f. *Suppl. Plant. ed. 13*: 103 (1781).

Illust.: Black, *Flor. S. Aust. ed. 2*: fig. 196 (1943); Schönland, *Mem. bot. Surv. S. Afr. 3*: 25, t. 10 (1922).

Vern.: Tiny Flat-sedge (Delicate Leaf-rush). *Distr.*: Frequent throughout cooler parts of Victoria, on damp usually sandy ground from the Lower Glenelg R. to Cape Howe, but apparently absent from the alps and Mallee districts (e.g. Grampians, Hawkesdale, Mt. Cole, Creswick, Castlemaine, Bendigo, Mt. Macedon, Brisbane Range, Anglesea, St. Leonards, Melbourne region, Dandenongs, Graytown, Arthur's Seat, Quail Id, Warragul, Mansfield, Wilson Prom., Marlo, Cann River); all mainland States, but confined to the south-east in Qd, N.Z., S. Afr.

—Perennial; leaves and bracts *flattened*, 1-2 mm. wide, very flaccid, the latter >2 cm. long; spikelets *numerous in lax compound umbels*; glumes *acute*:

453. *C. flaccidus* R. Br. *Prodr. Flor. Nov. Holl.* 213 (1810).

Illust.: Makino, *Ill. Flor. Jap.* 766 (1924), as "*C. hakonensis*".

Vern.: Flat-sedge (Lax Leaf-rush). *Distr.*: Very rare and localized in Victoria, where the only undoubted collection was from "swamps and watercourses" near Dimboola (Mar. 1895); wet places in N.S.W., Qd, N. Terr. (but not the arid interior), also recorded from Japan and Korea.

5. Inflorescence *variously compound*; if occasionally a single head, then the spikelets *darkly pigmented*

9

—Inflorescence a *single head* of crowded, \pm sessile, green or pale brownish spikelets

6

6. Spikelets *1-flowered* (glumes 2), tightly clustered in an *ovoid or globular green head* 5-10 mm. wide; style-arms 2; bracts 3-4, flat, up to 3" long (grass-like perennial <1 ft. high, with long-creeping rhizomes):

454. *C. brevifolius* (Rottb.) Hassk. *Plant. Hort. bot. bogor.* 24 (1844).

Kyllinga brevifolia Rottb. *Descr. Icon.* 13, t. 4 fig. 3 (1773);

Kyllinga intermedia R. Br. *Prodr. Flor. Nov. Holl.* 219 (1810).

Illust.: Rottböll (*l.c.*); Herter, *Flor. il. Uruguay 1*: fig. 638 (1942); Makino, *Ill. Flor. Jap.* 741 (1924), as "*Kyllinga brevifolia*"; Koorders, *Exkursiönsflor. Java 4*: 84 (1922); Brown in Clarke, *Ill. Cyperaceæ t. 1* fig. 1-4 (1909), as "*Kyllinga brevifolia*".

Vern.: Globe Kyllinga. *Distr.*: Not uncommon on wet flats and creek-banks of north-eastern and far eastern Victoria (Euroa, Strathbogie, Goorambat, Tolmie, Whitfield, Jamieson R., Suggan Buggan, Combienbar, Genoa), with sporadic isolated occurrences at Toururong Reservoir near Kinglake and near Bendigo; N.S.W., S.A., Qd, N.Z., N. Cal., N.G., Indonesia, Philippines, S. Asia, tropical Afr., warmer N. & S. Amer., Hawaii.

—Each spikelet *several-flowered*.

7. Densely tufted *annual*, rarely up to 4" tall (often <2"); spikelets in *compact*, \pm *globular green heads* about 1 cm. wide; bracts leafy, broadly sheathing; glumes numerous, *tightly imbricate*, acute; style-arms 2 (rarely 3):

455. *C. pygmaeus* Rottb. *Descr. Icon.* 20, t. 14 fig. 4-5 (1773).

Illust.: Kükenthal, *Pflanzenreich IV* 20 (Heft 101): 313 fig. F-G (1936), as "*C. michelianus* subsp."; Bouloumoy, *Flor. Liban & Syrie* t. 452 fig. 3 (1930).

Vern.: Flat-sedge (Dwarf Leaf-rush). *Distr.*: Confined in Victoria to northern river-banks where rare, localized, and known by only three collections—viz. Ovens R. (Feb. 1853), Mildura (May 1935), Murray R. at Colignan east of Nowingi (May 1953); all mainland States, Cent. Aust., N. G., Philippines, S. Asia, Madagascar, E. & N. Afr., Asia Minor, Mediterranean region.

—*Perennials*, usually >4" tall or, if less, then the glumes *loosely arranged* on oblong to linear spikelets

8. Leaves and bracts 2 mm. wide or more; spikelets > 10 *per head*, with *persistent rhachillas*; style-arms 2; nut biconvex (culms densely caespitose, \pm 3-angled, 8-18" tall):

456. *C. polystachyos* Rottb. *Descr. Icon.*: 39, t. 11 fig. 1 (1773).

Illust.: Rottböll (*l.c.*); Oliva in Barros, *Descole Gen. Spec. Plant. Argent.* 4¹: t. 35 B (1947); Herter, *Flor. il. Uruguay I*: fig. 626 (1942); St. John & Hosaka, *Res. Publ. Univ. Hawaii* 6: 64 (1932); Makino, *Ill. Flor. Jap.* 768 (1924); Koorders *Exkursionsflor. Java* 4¹: 85 fig. 196 (1922).

Vern.: Bunchy Flat-sedge. *Distr.*: Known in Victoria from a single locality, viz. Prince's Highway near Providence Ponds in Gippsland (Apr. 1957), and perhaps a recent introduction there; N.S.W., Qd, tropical N. Aust., N.G., N. Cal., Polynesia, Hawaii, Indonesia, Japan, S. Asia, Mediterranean, Afr., Cent. Amer., W. Indies, tropical & subtropical S. Amer.

—Leaves and bracts <2 mm. wide (almost *filamentous*); spikelets <10 *per head*, their rhachillas articulate and *falling with glumes attached*; style-arms 3; nut trigonous, linear-oblong (Mallee plant, often <3" high in Victoria):

457. *C. rigidellus* (Benth.) J. M. Black *Flor. S. Aust.* 676 (1929).

C. gracilis R. Br. var. *rigidella* Benth. *Flor. aust.* 7: 266 (1878);

C. gracilis sens. Ewart *Flor. Vict.* 215 (1931) pro parte, non R. Br. (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 198 (1943).

Vern.: Flat-sedge. *Distr.*: Rare and very localized in Victoria where known by only two collections from the Mallee—viz. Lake Hindmarsh (Apr. 1895), Lake Hattah (Feb. 1952); also N.S.W., S.A. and interior parts of Qd.

9. Perennials >6" tall or, if annual and <6", then the glumes darkly pigmented and/or obtuse 11
 —Annuals <6" tall; glumes rather *pale greenish-brown, strongly costulate*, acute and \pm *recurved* at apex (slender delicate Mallee plants) 10
10. Rhachilla *not winged*, articulate and *falling with spikelet* as a whole; glumes 8-30, *boldly recurved in upper third*; style-arms 3 (distinctive *curry-like odour* often present in dried plants):

458. *C. aristatus* Rottb. *Descr. Icon.* 23, t. 6 fig. 1 (1773).

C. squarrosus sens. Ewart *Flor. Vict.* 214 (1931), *non* L. (1756) sens. strict.

Illust.: Rottböhl (*l.c.*); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 128 (1957); Kükenthal, *Pflanzenreich IV* 20 (Heft 101): 500 fig. 55 F-J (1936); Marie-Victorin, *Flor. Laurent.* 683 (1935); Koorders, *Exkursionsflor. Java* 4^a: 90 fig. 207 (1922).

Vern.: Bearded Flat-sedge (Tufted Leaf-rush). *Distr.*: Restricted in Victoria to damp situations in the Mallee and uncommon (Near Dimboola, Lake Hattah), but perhaps overlooked; all mainland States, Cent. Aust., Indonesia, China, S. Asia, N. Afr., E. & S. Afr., N. & Cent. Amer., tropical S. Amer.

—Rhachilla *winged, persistent*; glumes >20, shortly and *minutely recurved at apex*; style-arms 2 (plants without distinctive odour):

459. *C. nervulosus* (Kükenth.) S. T. Blake in *Proc. roy. Soc. Qd* 51: 41 (1940).

C. pumilus L., var. *nervulosus* Kkenth. in *Pflanzenreich IV* 20 (Heft 101): 378 (1936).

Illust.: Nil.

Vern.: Flat-sedge. *Distr.*: Perhaps a recent introduction to Victoria where known by a single collection from Lake Hattah in Kulkyn Nat. Park (Feb. 1953); otherwise restricted to the tropics in N.E. Queensland, N. Aust. and N.G.

11. Larger spikelets <8 times as long as broad (often only 5-6 times) but, if ever >8 times, then greenish or pale brown (when sometimes with densely packed *minute* glumes \pm 1 mm. long, and hundreds of spikelets to each highly compound inflorescence) 15

—Larger spikelets narrow-linear, >8 times as long as broad (and up to 15 times), *chestnut to dark purplish-brown*; glumes >2 mm. long 12

12. Spikelets relatively *few*, in very shortened spikes on the rays, *constantly flat*, \pm 2 mm. wide, often >16-flowered; rhachilla *persistent* (plants with *tuber-bearing rhizomes*) 14

—Spikelets *numerous*, in dense clusters or elongated spikes on the rays, at first *subterete* or \pm 4-angled, < 2mm. wide, up to 16-flowered; rhachilla articulate, *falling attached to the glumes* (*non-tuberous* plants with acutely 3-angled culms) 13

13. Plant <1 ft. high; culms slender, <1 mm. wide; leaf-blades <2 mm. wide; primary rays of inflorescence undivided; glumes subobtusely, 2-2.5 mm. long:

460. *C. subulatus* R. Br. *Prodr. Flor. Nov. Holl.* 217 (1810).

Illust.: Nil.

Vern.: Flat-sedge. *Distr.*: In Victoria known only by two collections from "swampy and inundated places" in the Shire of Dimboola—probably near Wimmera R. (Jan. & Feb. 1895); N.S.W., Qd, ? W.A.

- Plant typically >1 ft. high; culms >1 mm. wide (usually >2 mm.); leaf-blades >2 mm. wide, *non-septate*; rays of inflorescence *short, undivided*, with *congested* spikelets; glumes subobtusely 3-4 mm. long;

461. **C. congestus* Vahl *Enum. Plant.* 2: 358 (1806).

Illust.: *Gdnrs' Chron.* ser. 3, 86: 305 fig. 146 (1929); Schönland, *Mem. bot. Surv. S. Afr.* 3: 31, t. 23 (1922), as "*Mariscus congestus*".

Vern.: Dense Flat-sedge. *Distr.*: Indigenous to South Africa; introduced and now becoming widespread in the Mediterranean, Cent. Europe, Caucasus, W.A., S.A., N.S.W. and Victoria where a weed of damp ground in Dimboola district, Brighton (and doubtless other parts of Melbourne area), Providence Ponds and Lakes Entrance.

- As for the last, but leaf-blades *prominently septate-nodulose* (often 1 cm. wide), primary rays 2-7" long and *again divided* into secondary spikes with \pm perpendicular spikelets *loosely arranged* (widespread robust sedge 2-5 ft. high):

462. *C. lucidus* R. Br. *Prodr. Flor. Nov. Holl.* 218 (1810).

Illust.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 139, col. (1858), as "*C. sanguineofuscus*".

Vern.: Leafy Flat-sedge (Common Leaf-rush). *Distr.*: Frequent in swamps, around lakes and by watercourses throughout the cooler parts of Victoria, but never alpine (e.g. Lower Glenelg R., Wannon R., Grampians, Dimboola, Portland, Warrnambool, Colac, Mt. Cole, Creswick, Anglesea, Brisbane Range, Lerderdarg R., Melbourne region, Dandenongs, Taggerty, Seymour, Howqua R., Mitta Mitta, Morwell, Wilson Prom., Suggan Buggan, Bonang, Genoa R.); Tas., N.S.W., Qd, ? W.A.

[The most widely distributed variety, and only one represented in Victoria, has more remote glumes and comparatively narrower nuts than in the typical Port Jackson form; it is distinguished as var. *sanguineofuscus* (Nees, *ut sp.*) Kükenth. in *Pflanzenreich IV* 20 (Heft 101): 449 (1936).]

14. Culm up to 1 ft. high, <3 mm. wide, *3-angled throughout*; lowest bract seldom much exceeding inflorescence (often *shorter*); glumes *dark, purplish-brown*, often *obtusely* and emarginate; nuts hardly ever maturing, and reproduction largely by means of tubers:

463. *C. rotundus* L. *Spec. Plant.* 1: 45 (1753).

Illust.: Gardner in Meadly, *J. Dep. Agric. W. Aust.* ser. 3, 6: 422 (1957); Black, *Flor. S. Aust.* ed. 2: fig. 191 (1943); Blake, *Pap. Dep. Biol. Univ. Qd* 2^a: t. 4 (1942); Carn, *Control Weeds N.S.W.* 34 (1939); Wall in Clarke, *Bull. Dep. Agric. S. Aust.* 313: t. opp. 32, col. (1937); White, *Qd Agric. J.* 42: 361 (1934); Eaton in Abrams, *Ill. Flor. Pacific States I*, ed. 2: fig. 618 (1940); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 132 (1957); Kükenth., *Pflanzenreich IV* 20 (Heft 101): 109 fig. 13 (1936); Makino, *Ill. Flor. Jap.* 772 (1924); Maiden, *Weeds N.S.W.* 33 (1920); Wauer in Ewart, *Weeds . . . Vict.* t. opp. 62, col. (1909).

Vern.: Nut-grass. *Distr.*: Troublesome weed of cultivation and damp pastures, probably indigenous in northern Victoria but now widespread with settlement (Dimboola, Horsham, Murrayville, Hopetoun, Swan Hill, Nathalia, Benalla, Kyabram, Wodonga, Melbourne district, Bairnsdale etc.); all States except Tas. (?), N.Z., cosmopolitan in most warm countries.

—Culm 1-3 ft. high, usually >3 mm. wide, 3-angled *only toward apex*; lowest bract usually erect and *much exceeding the inflorescence* (which is often thrown to one side); glumes *pale brown to chestnut, acute*; nuts freely produced:

464. *C. victoriensis* C. B. Clarke in *Kew. Bull. Add. ser. 8*: 12 (1908).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 190 (1943); Blake, *Pap. Dep. Biol. Univ. Qd* 2*: t. 3 (1942).

Vern.: Flat-sedge. *Distr.*: Restricted in Victoria to the Mallee and uncommon (Dimboola, Murray R. at Red Cliffs and doubtless other inundated parts of Far North-west); inland watercourses of all mainland States, Cent. Aust.

15. Inflorescence *wholly brown or greenish*, on culms >1 ft. high; bracts 2-9, the *lowermost >6" long* (and often up to 2 ft.); rhachilla of spikelet *persistent* 19

—Inflorescence variously *red-brown or with dark purplish tints*; if ever greenish-brown or on culms of >1 ft., then either the bracts *all <6" long* or the rhachillas *deciduous* 16

16. Spikelets largely or in part *dark purplish*, seldom >5 times as long as broad; glumes *obtusely, almost nerveless*, falling away from a *persistent* rhachilla (soft slender plants up to 1 ft. high, seldom to 18") 18

—Spikelets *not* darkly pigmented; if ever slightly purplish, then >5 times as long as broad or the glumes manifestly costulate or acute (sometimes both) 17

17. Culm *slender, <1 mm. wide*; leaves long, almost *filiform* (1-2 mm. broad); inflorescence *loose*, of rather few spikelets, *often unbranched*; rhachilla *persistent*; glumes *almost nerveless*, obtuse; style-arms 2:

465. *C. flavidus* Retz. *Obsns bot.* 5: 13 (1789).

C. globosus All. *Auctuar. Flor. Ped.* 49 (1789), *non* Forsk. (1775).

Illust.: Makino, *Ill. Flor. Jap.* 769 (1924); Koorders, *Exkursionsflor. Java* 4*: 86 fig. 198 (1922); Reichenbach, *Icon. Flor. germ.* 8: t. 279 fig. 665, col. (1846); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2861, col. (1930-1931); Coste, *Flor. Franc.* 3: fig. 3749 (1906)—all as "*C. globosus*".

Vern.: Flat-sedge (Rough Leaf-rush). *Distr.*: Confined in Victoria to marshy places of the north-east, where rare and localized, viz. Upper & Lower Hume R. (Jan. 1874) and Yackandandah (Apr. 1941); N.S.W., Qd, N.G., Philippines, Indonesia, China, Japan, S. Asia.

[Victorian collections have been referred to *C. globosus* All. var. *nilagiricus* (Hochst.) C. B. Clarke in *J. Linn. Soc. (Bot.)* 21: 49 (1884), having spikelets narrower and more strongly compressed than in the typical form.]

—Culm > 1 mm. wide; leaves > 2 mm. broad, manifestly *septate-nodulose* (in dried state); spikelets \pm densely arranged on branches of inflorescence, the rhachillas *deciduous*; glumes prominently *costulate*, *obtus*; style-arms 3:

466. *C. gunnii* Hook. f. *Flor Tasm.* 2: 80, t. 140 fig. A, col. (1858).

Illust.: Fitch in Hooker f. (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 197 (1943).

Vern.: Flecked Flat-sedge (Flecked Leaf-rush). *Distr.*: Widespread and rather common in many swampy situations through the cooler parts of Victoria, but not in alps (e.g. Dimboola, Grampians, near Bendigo, Curdie's R., Brisbane, Range, Steel's Ck, Beveridge, Goulburn R., Graytown, Wangaratta, Whitfield, Edi, Warragul, Cann River), also recorded for Far North-west but doubtful; all States except W.A., Cent. Aust.

—As for the last, but leaves and bracts *not or only obscurely septate-nodulose* and the glumes *acute* or distinctly *mucronate*:

467. *C. rutilans* (C. B. Clarke) Maiden & Betche *Cens. N.S.W. Plant.* 28 (1916).

Mariscus rutilans C. B. Clarke in *Kew Bull.* Add. ser. 8: 18 (1908).

Illust.: Kükenenthal, *Pflanzenreich IV* 20 (Heft 101): 454 fig. 50 G-H (1936).

Vern.: Flat-sedge. *Distr.*: Scattered on wet ground through the lowlands of western and central Victoria (Wimmera R. at Wail and Dimboola, Harcourt, Toolern Vale, Mansfield, Goulburn R.) with an isolated occurrence at Orbost, but precise range uncertain owing to confusion with *C. gunnii* and other species; N.S.W., Qd (south-east), S.A., Cent. Aust.

18. Spikelets rather few (< 20 per culm), 2-3 mm. wide; glumes ± 2 mm. long, with *dark margins* (green on keel and on sides); style-arms 2 (chiefly annual):

468. *C. sanguinolentus* Vahl *Enum. Plant.* 2: 351 (1806).

C. eragrostis Vahl *l.c.* 322, non Lam. (1791).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 200 (1943); Makino, *Ill. Flor. Jap.* 770 (1924).

Vern.: Flat-sedge (Dark Leaf-rush). *Distr.*: Scattered in wet places (creek-banks, springs etc.) almost throughout Victoria, except in Mallee and alps, and locally frequent (e.g. Lochiel near Dimboola, Bendigo, Sedgwick, Harcourt, Lara, Melbourne, Pakenham, Euroa, Goorambat, Jamieson R., Howqua R., Ovens R., Mt. Buffalo, Yackandandah, Upper Murray R. at Tom Groggin, Suggan Buggan, Cabbage-tree Ck, Noorinbee, Genoa); all mainland States, N.G., Indonesia, Philippines, S. & Cent. Asia, E. & N. Afr.

[Australian populations are all referable to var. *areolatus* (R. Br.) Kükenth. in *Pflanzenreich IV* 20 (Heft 101): 338 (1936), differing from the typical Afro-Asiatic form only in the *blackish margins* to the glumes.]

—Spikelets *numerous* (> 20 per culm), ± 1 mm. wide, packed in a few almost *globoid clusters*; glumes < 1 mm. long, *cucullate*, *wholly dark* except for the green keel (rarely pale all over); style-arms 3 (annual):

469. *C. difformis* L. *Cent. 2 Plant.* 302 (1756).

Illust.: Mahood in Chippendale, *Poison. Plant. N. Terr.* Pt. 2: fig. 8 (1958); Black, *Flor. S. Aust.* ed. 2: fig. 195 (1943); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 130 (1957); Kükenthal, *Pflanzenreich IV* 20 (Heft 101): 238 fig. 27 F-H (1936); Makino, *Ill. Flor. Jap.* 767 (1924); Koorders, *Exkursionsflor. Java* 4²: 91 fig. 212 (1922); Schönland, *Mem. bot. Surv. S. Afr.* 3: 26, t. 13 (1922); Reichenbach, *Icon. Flor. germ.* 8: t. 284 fig. 674, col. (1846).

Vern.: Variable Flat-sedge (Variable Leaf-rush). *Distr.*: Restricted in Victoria to inundated ground of northern districts, but locally frequent (near junction of Murray R. & Darling R., Mildura, Colignan on Murray R. east of Nowingi, Lake Hindmarsh, Myall near Kerang, Greta West); all mainland States, Cent. Aust., S.E. Asia, Philippines, and introduced into many warm parts of the world (e.g. California, Mexico, S. Africa).

—Spikelets numerous (>20), ovate-lanceolate, 2-3 mm. wide, in a loose compound inflorescence; glumes \pm 1.5 mm. long, tightly imbricate, with narrow pale margins (shortly rhizomic perennial):

470. *C. concinnus* R. Br. *Prodr. Flor. Nov. Holl.* 214 (1810).

Illust.: Kükenthal, *Pflanzenreich IV* 20 (Heft 101): 246 fig. 28 H-I (1936).

Vern.: Flat-sedge (Trim Leaf-rush). *Distr.*: Scattered and rare in Victoria where known by only a few collections (Wimmera without exact location, "between Loddon R. and Creswick Ck", Mt. Hope, Snowy & Deddick Rivers); also N.S.W. and Qd, in damp places from coast to highlands but never far inland.

19. Bracts 4-6; spikelets extremely numerous and congested (1000's per culm), rich brown, lustrous, 20- to 40-flowered; glumes 1-1.5 mm. long; style-arms 3 (tall sedge, chiefly on northern rivers):

471. *C. exaltatus* Retz. *Obsns. bot.* 5: 11 (1789).

Illust.: Oliva in Barros, *Descole Gen. Spec. Plant. Argent.* 4¹: t. 6 (1947); Kükenthal, *Pflanzenreich IV* 20 (Heft 101): 65 fig. 9 A-F (1936); Koorders, *Exkursionsflor. Java* 4²: 96 (1922).

Vern.: Tall Flat-sedge (Tall Leaf-rush). *Distr.*: Scattered but locally common on river-banks and lagoons of northern Victoria (Lake Hindmarsh, Murray R. upstream from Koondrook, Goulburn & Broken Rivers, Violet Town, Miepoll), with an apparently isolated record for Bairnsdale; all mainland States, Cent. & N. Aust., Indonesia, Japan, tropical and subtropical Asia & Africa, ? S. Amer.

—Bracts 5-9; spikelets very numerous (100's per culm), greenish, rather dull, often <24-flowered; glumes \pm 2 mm. long; style-arms 3:

472. **C. eragrostis* Lam. in *Tabl. encycl.* 1: 146 (1791).

C. vegetus Willd. *Spec. Plant.* 1: 283 (1797),

Illust.: Pomeroy in Mason, *Flor. Marshes Calif.* fig. 127 (1957); Oliva in Barros, *Descole Gen. Spec. Plant. Argent.* 4¹: t. 16 (1947); Herter, *Flor. il. Uruguay* 1: fig. 619 (1942); Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 616 (1940), as "*C. vegetus*"; Poincot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2857, col. (1930-31), as "*C. vegetus*"; Coste, *Flor. Franc.* 3: fig. 3754 (1906), as "*C. vegetus*".

Vern.: Drain Flat-sedge (Umbrella Sedge). *Distr.*: Indigenous to America (Washington & California States south to Argentina), but now a widespread weed in warmer parts of S. Eur., Canary Is, S. Afr., N.Z. and temperate E. Aust.; frequent in damp places through many lowland areas in Victoria, especially the irrigation districts (e.g. Werribee, Melbourne, Goulburn Valley, Bendigo, Wycheproof, Cobden, Ballarat, Warragul district, Orbost).

—Bracts 2-3; spikelets rather few (<50 per culm), large (10-15 × 5 mm.) rich brown, very lustrous, <24-flowered; glumes 3-4 mm. long, ± chartaceous; style-arms 2:

473. *C. unioides* R. Br. *Prodr. Flor. Nov. Holl.* 216 (1810).

Illust.: Ewart, *Flor. Vict.* fig. 125 (1931); Eaton in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 610 (1940); Fitch in Clarke, *Ill. Cyperaceæ* t. 4 (1909), as "*Pycreus angulatus*".

Vern.: Flat-sedge (Mussel Leaf-rush). *Distr.*: Known for Victoria solely by an old collection from "springs on the Upper Hume R., 3-4000 ft." (Jan. 1874), and that may have come from the Kosciusko side of the river; N.S.W., Qd, N.G., Indonesia, Philippines, Japan, S. Asia, Africa, tropical America.

[*Cyperus gracilis* R. Br. has been recorded for Victoria on the basis of a single fragment from C. Walter's herbarium, labelled "Victorian Alps, Jan. 1900"; but, as the genus *Cyperus* is otherwise quite unknown from any alpine portion of this State, the accuracy of Walter's label remains highly dubious. *C. gracilis* is largely a tropical or subtropical sedge, unlikely to occur as far south as Victoria and certainly not at high altitudes.]

Tribe SCIRPEÆ

172. LIPOCARPHA R. Br. in Tuckey (1818)

474. *L. microcephala* (R. Br.) Kunth *Enum. Plant.* 2: 268 (1837).

Hypelytrum microcephalum R. Br. *Prodr. Flor. Nov. Holl.* 220 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 212 (1943); Makino, *Ill. Flor. Jap.* 741 (1924).

Vern.: Button Rush. *Distr.*: Inundated ground near rivers in north-western and north-eastern Victoria and uncommon (Wimmera R., Mildura, Lake Hattah, King & Ovens Rivers); inland parts of all States except Tas., N. & Cent. Aust., N.G., Philippines, Japan, Malaya.

Diagn.: Small annual several inches high (rarely only 1"); leaves radical, filiform; involucre bracts leaf-like, usually 2, much exceeding the cluster of 2-5 terminal sessile spikelets; spikelet ovoid, 3-4 mm. long, pale green, many-flowered, with narrow pointed glumes and bisexual florets; style-arms 2; stamens 1 or 2; nut compressed, linear-oblong, brown, about 1 mm. long, almost enclosed until maturity by 2 long, broad, glume-like hypogynous scales.

173. SCIRPUS L. (1753)

[The genus *Scirpus* is here maintained in its broad sense, and no attempt has been made to recognize such segregate genera as *Holoschanus* Link, *Blysmus* Schult., *Schanoplectus* Palla, *Isolepis* R. Br. and *Eleogiton* Link—all of which were adopted by Clapham, Tutin and Warburg in *Flora of the British Isles*, 1952.]

1. Small or weak (sometimes annual) plants normally <1 ft. high; spikelets *greenish to bright chestnut-brown*; hypogynous bristles *absent* (except in the very rare *S. dissachanthus* from near Kaniva and *S. forsythii* from Genoa River) [Section *ISOLEPIS*] 7
 Stout perennials normally >1 ft. (and often up to 5 ft.) high; spikelets *wholly dull brown*; hypogynous bristles *present* (except in the sand-loving, wiry-culmed *S. nodosus* which belongs to the section *Isolepis*) 2
2. Involucral bracts 2 or more, *flat and leaf-like*; culm \pm triquetrous 5
 Involucral bract 1, erect and appearing to be a continuation of the culm 3
3. Culm *triquetrous*, usually 1-2 ft. high, with *grass-like*, \pm bluish basal leaves; spikelets dark brown, usually sessile in a cluster of 3-6, each 6-12 mm. long; nut pale, broad, plano-convex:

475. *S. americanus* Pers. *Synops. Plant.* 1: 68 (1805).

S. pungens Vahl *Enum. Plant.* 2: 255 (1806).

Illust.: Pomeroy in Mason, *Flor. Marshes Calif.* fig. 152 (1957); Herter, *Flor. il. Uruguay* 1: fig. 644 (1943); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1102 (1931); Jepson, *Manual Flower. Plant. Calif.* fig. 149 (1923); Reichenbach, *Icon. Flor. germ.* 8: t. 304, col. (1846), as "*S. pungens*".

Vern.: American Club-rush (Sharp Leaf-rush). *Distr.*: Scattered in coastal districts of Victoria (Melbourne area, Lara, Lake Colac, Mt. Emu Ck, Warrnambool, Lower Glenelg R., also Snowy R.), usually on inundated flats or damp saline depressions farther inland; S.A., W.A., N.Z., N. & S. Amer., Europe.

[*S. pungens* var. *nanus* Benth. *Flor. aust.* 7: 333 (1878) is, as suggested by its author, only a "starved state" of the species, 2-3" high.]

—Culm cylindrical, often very tall; basal leaves *reduced to sheaths*, the blades obsolete 4

4. Culm 2-4 mm. wide, *wiry*, tough and hard; inflorescence a *globular cluster* of numerous sessile spikelets, each about 4-5 mm. long:

476. *S. nodosus* Rottb. *Descr. Icon.* 52, t. 8 fig. 3 (1773).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 208 (1943); Phillips, *Mem. bot. Surv. S. Afr.* 14: fig. 7 (1931); *Dtsch. Tiefsee-Exped. 1898-99*, 2¹: 193 t. 11-13, 15 (1905).

Vern.: Knobby Club-rush (Knotty Club-rush). *Distr.*: Widespread and rather frequent in lowland Victoria (except the North-east and Far North-west) on moist sand, especially of coastal dunes and along rivers; all States and almost throughout temperate parts of southern hemisphere.

—Culm usually >4 mm. wide, *soft* and easily flattened; inflorescence a *loose branched panicle*; spikelets 5-10 mm. long, in stalked umbels:

477. *S. validus* Vahl *Enum. Plant.* 2: 268 (1806).

S. lacustris sens. Ewart *Flor. Vict.* 221 (1931), atque auctt. Aust. plur., non L. (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 211 (1943); Herter, *Flor. il. Uruguay* 1: fig. 646 (1943); Britten & Brown, *Ill. Flor. north. U.S. & Canad.* ed. 2, 1: 331 (1913); *Rhodora* 6: t. 52 (1904).

Vern.: River Club-rush (Lake Club-rush). *Distr.*: Widespread and common in shallow fresh water along river-banks, lagoons and streams of lowland Victoria; all States, N.Z., N.G., Indonesia, N. & S. Amer. [A useful plant for rush-mats, basketry etc.]

5. Spikelets <1 cm. long, dark brown, very numerous in a large compound panicle several inches long; glumes *obtuse*; hypogynous bristles flexuose, 2-3 times as long as nut (rare plant of far eastern, montane water-courses):

478. *S. polystachyus* F. Muell. in *Trans. phil. Soc. Vict.* 1: 108 (1855).

Illust.: Ewart, *Plant. indig. Vict.* t. 85 opp. 22 (1910); Fitch in Clarke, *Ill. Cyperaceæ* t. 51 fig. 6-7 (1909).

Vern.: Large-head Club-rush (Spiked Club-rush). *Distr.*: Scattered and uncommon along highland streams of north-eastern and far eastern Victoria (Lake Omeo, source of Limestone Ck, Towong, Wulgulmerang, Upper Delegate R.); also N.S.W.

—Spikelets 1-2 cm.; rufescent-brown, clustered in an irregularly umbellate inflorescence <3" long; glumes *pointed*; hypogynous bristles *hardly or not exceeding* the nut (lowland plants, often in or near brackish water, the rhizomes frequently bearing tubers) 6

6. Style-branches 2; nut *flattened*; hypogynous bristles usually 2:

479. *S. maritimus* L. *Spec. Plant.* 1: 51 (1753).

Illust.: Ewart, *Flor. Vict.* fig. 127 (1931); Herter, *Flor. il. Uruguay* 1: fig. 648 (1943); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2871, col. (1930-1931).

Vern.: Sea Club-rush. *Distr.*: Scattered in shallow, and usually brackish, water along lakes and streams of southern Victoria (e.g. Lara, Colac, Yarra & Snowy Rivers), but precise range unknown owing to confusion with *S. fluviatilis*; all States, Cent. Aust., and almost cosmopolitan.

—Style-branches 3; nut *3-angled*; hypogynous bristles 6:

480. *S. fluviatilis* (Torr.) A. Gray, *Manual Bot. nth. U.S.* 527 (1848).

S. maritimus L. var. *fluviatilis* Torr. in *Ann. Lyc. nat. Hist.* 3: 324 (1826).

Illust.: Ewart, *Flor. Vict.* fig. 126 (1931), as "*S. maritimus*"; Pomeroy in Mason, *Flor. Marshes Calif.* fig. 148 (1957); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1105 (1931), as "*S. maritimus*"; Eaton in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 662 (1940); Reichenbach, *Icon. Flor. germ.* 8: t. 310, col. (1846), as "*S. maritimus*".

Vern.: Marsh Club-rush (River Bulrush). *Distr.*: Widespread and rather frequent in lowland Victoria, usually in shallow, sometimes brackish water (e.g. Far North-west, Dimboola, Warrnambool, Melbourne, Bairnsdale, Cann R., Upper Murray R.); N.S.W., Qd, S.A., N.Z., Eurasia, N. Amer.

7. Spikelets *never* simultaneously 5-10 mm. long, in clusters, *and* with transversely rugose, flattened nuts 9

Spikelets 5-10 mm. long, a few together forming an apparently *lateral cluster*, the subtending bract *very conspicuous* (2-6 cm. long); style-branches and stamens normally 2; nut dark, somewhat flattened *transversely ridged* 8

8. Spikelets \pm *ovoid*, some usually pedunculate, marked with *reddish-brown*; hypogynous bristles *absent or much reduced*; nut *black* (culm without any basal flower):

481. *S. lateriflorus* J. F. Gmel. *Syst. Nat.* ed. 13, 2: 127 (1791).

S. supinus sens. Ewart *Flor. Vict.* 220 (1931), atque auctt. plur., non L. (1753).

Illust.: Hayata, *Icon. Plant. Formosa* 6: 114 fig. 31 (1916), as "*S. erectogracilis*"; Fitch in Clarke, *Ill. Cyperaceæ* t. 48 fig. 11-12 (1909), as "*S. erectus*".

Vern.: Soft Club-rush. *Distr.*: Localized and rare in Victoria, where known only from drying mud in the Far North-west, Lake Lalbert and Dimboola; all States except Tas., N. Terr., Indonesia, E. & S. Asia, tropical & subtropical Africa.

—Spikelets *cylindrical, all sessile, pale*; hypogynous bristles *present*, well-developed; nut *brown*; a solitary 3-merous *female flower* present within a sheath *at base of culm*:

482. *S. dissachanthus* S. T. Blake in *Vict. Nat.* 63: 116, 118 fig. 1-7 (1946).

Illust.: Blake (*l.c.*).

Vern.: Club-rush. *Distr.*: In Victoria known only from Merwyn Swamp, 8½ miles E. of Kaniva, in the western Wimmera (Mar. 1952 *et seq.*); also S.A. (on the Murray R.), Qd and northern Australia, but doubtless overlooked and more widespread in damp inland parts.

9. Nut 3-angled or prominently convex on the back and style-branches 3, *or else* the spikelets mostly 2-several in a cluster 13
Nut *flattened, smooth*; style-branches 2; spikelet *solitary* (perennials, usually growing *in or near water*) 10
10. Culms reed-like, somewhat resinous to the touch, *leafless* except for basal sheaths; spikelet *lateral* to a long, *erect, stem-like bract*; hypogynous bristles *present*; nut *blackish* (small rare plant of the extreme east, rooting in mud):

483. *S. forsythii* Kükenth. in *Repert. Spec. nov. Regn. veg.* 12: 94 (1913).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: Restricted in Victoria to wet soil among granite rocks along Genoa R., in the gorge tract about 3 miles above Genoa township (Jan. 1947, Mar. 1949); also N.S.W. (Nepean R.).

—Culms (or rhizomes) *leafy* at the nodes; subtending bract *small or none*; nut *grey* 11

11. Spikelet *stout*, 5-8 mm. long; nut much *longer than wide*, its margins thickened; stamens 3 (semi-aquatic alpine or subalpine plant, rooting in mud):

484. *S. crassiusculus* (Hook. f.) Benth. *Flor. aust.* 7: 326 (1878).

Isolepis crassiuscula Hook. f., *Flor. Tasm.* 2: 86 (1858), t. 143 fig. A, col. (1859).

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Alpine Club-rush. *Distr.*: Not uncommon in bog formation, often in shallow pools, of the alps and subalpine regions of Victoria (Baw Baws, Mt. Wellington, Cobungra, Bogong & Dargo High Plains, Cobboras etc.); N.S.W., Tas., N.G. (Lake Habbema at 10,500 ft.).

—Spikelet 2-5 mm. long; nut almost *as wide as long*; stamens 2 (chiefly lowland plants) 12

12. Plant usually *pale green*; stems either floating and elongated or terrestrial and tufted; nut *not thickened* at the edges:

485. *S. fluitans* L. *Spec. Plant.* 1: 48 (1753).

Illust.: Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1098 (1931); Marloth, *Flor. S. Afr.* 3: t. 43 (1932); Poincot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2881, col. (1930-31); Scholl in Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 201 (1908), as "*Isolepis fluitans*"; Reichenbach, *Icon. Flor. germ.* 8: t. 298, col. (1846).

Vern.: Floating Club-rush. *Distr.*: Widespread and frequent in cooler parts of Victoria, both in running water and on wet flats; N.S.W., W.A., S.A., Tas., N.Z., Afr., Eurasia.

—Plant *purplish* (at least on leaf-sheaths and glumes); stems always floating; nut \pm *thickened* at the edges:

486. *S. productus* C. B. Clarke in *Kew Bull. Add. Ser.* 8: 28 (1908).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: In Victoria known with certainty only from Portland district, Yarra R., Lake King and Delegate R., but probably more widespread and overlooked because of its resemblance to *S. fluitans*; also S.A., Tas.

[Some populations appear to combine the features of *S. productus* and *S. fluitans*, which are very closely allied, and future investigation may prove both to be no more than conditions of a single variable species.]

13. Glumes terminating in *distinct spreading awns* at least as long as the winged part (tufted leafy annual 1-3" high, the spikelets few together or solitary):

487. **S. hystrix* Thunb. *Prodr. Plant. capens.* 17 (1800).

Illust.: Schönland, *Mem. bot. Surv. S. Afr.* 3: t. 40 (1922).

Vern.: Awned Club-rush. *Distr.*: Native to S. Africa; introduced and naturalized in damp open places of western and north-eastern Victoria (at Upper Glenelg R., Creswick, Heathcote, Graytown and Baddaginnie near Benalla).

—Glumes *not* or hardly awned

14. Inflorescence with 1 sessile cluster of spikelets and usually also with 1 or 2 *pedunculate clusters*; glumes acuminate, with spreading tips; nut *narrow-oblong*, broadest at the apex (tufted leafy annual of far north-west Mallee, 1-3" high): 14

488. **S. hamulosus* (Bieb.) Steven in *Mém. Soc. Nat. Moscou* 5: 356 (1814).
Cyperus hamulosus Bieb. *Flor. taur.-caucas.* 1: 35 (1808).

Illust.: Stoyanoff & Stefanoff, *Flor. Bulgarie* 181 (1925).

Vern.: Club-rush. *Distr.*: Native to eastern Europe and south-western Asia; naturalized in Central and South Australia (where presumed to have been introduced with camels from Afghanistan), and collected in Victoria on the Murray R. south-east of Red Cliffs (Apr. 1951).

—Inflorescence with spikelets either in a *single sessile cluster* or solitary, but proliferating in some species (*S. inundatus* and *S. prolifer*); nut *never* >twice as long as wide 15

15. Nut with a *subconical basal foot* (receptacle), equally *triquetrous* with flat faces and subacute angles, pale at first but finally *dark chestnut-brown*, ± 0.7 mm. long ($> \frac{1}{2}$ as long as the glume); spikelets 3-6 mm. long, a few together; glumes rigid, boat-shaped, incurved, usually reddish or purplish-brown on the wings (tufted leafy annual 1-4" high):

489. *S. antarcticus* L. *Mant. Plant.* 2: 181 (1771).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 209 (1943); Fitch in Hooker f., *Flor. Tasm.* 2: t. 145 A-C, col. (1859), as "*Isolepis cartilagineus*".

Vern.: Club-rush. *Distr.*: Widespread and frequent in damp places throughout the lowlands of Victoria; all States except (?) Qd, N.Z., temperate S. Amer. & S. Afr.

—Nut *without a foot*, or with only a \pm obsolete or discoid basal receptacle; plants further differing from the last in glume or nut characteristics (or both) 16

16. Inflorescence with *proliferous offshoots*; spikelets *very numerous*, each up to 1 cm. long and narrow-cylindrical; nut triquetrous, about *twice as long* as wide, pale yellow; stamens 3 (leaf-blades and involucre bracts lacking):

490. **S. prolifer* Rottb. *Descr. Icon.* 55, t. 17 fig. 2 (1773).

Illust.: Rottböll (*l.c.*); *Flora, Jena* 107: 205-7 (1914).

Vern.: Club-rush. *Distr.*: Native to S. Africa, and apparently an early introduction to Australia where practically confined to the Port Jackson area, N.S.W., and isolated occurrences in western Victoria (Clarkefield, near Mt. Macedon, and Fyans Ck in the Grampians).

—Either the inflorescence not proliferous, the nut almost as wide as long or stamen only 1 17

17. Glumes *strongly keeled*, the apices usually acute and somewhat *spreading*; nut up to $\frac{1}{2}$ the length of glume, either subglobose or about twice as long as wide or ± 0.5 mm. long (apparently annuals with culms usually much <6" high) 24

Glumes *broadly winged* (up to apex), the tips *not* or hardly spreading; nut >0.5 mm. long (usually ± 1 mm.), >half as long as the glume, *trigonous* or *flattened* (*perennials*, or occasionally annual under adverse conditions) 18

18. Nut <1 mm. long [rarely to 1.2 mm. in some *S. merrillii* from alpine stations], normally *remaining pale yellowish* (occasionally darkening to reddish-brown); stamens normally 1 per floret (rarely more in lower part of some spikelets) 22

Nut 1 mm. long or more, finally *grey or fuscous-brown*; stamens 3 (rarely less in upper part of some spikelets) 19

19. Nut *subequally trigonous*, with each of the three angles equally thickened into a *conspicuous rib*; plant tufted, not rhizomic, 2-3" high; leaf-blades well developed but shorter than culms; spikelet solitary or 2-3 together (montane to alpine):

491. *S. gunnii* Boeck. in *Linnaea* 36: 493 (1870).

Isolepis alpina Hook. f. *Flor. Tasm.* 2: 86 (1858), t. 143 B, col. (1859), non *Scirpus alpinus* Schlecht. (1821).

Illust.: Fitch in Hooker f. (*l.c.*), as "*Isolepis alpina*".

Vern.: Club-rush. *Distr.*: Apparently rare (or overlooked) in Victoria where known with certainty only from the Bogong High Plains (alpine terrain) and Mt. Kaye in E. Gippsland; also Tas. (alpine moorlands and tarns).

—Nut somewhat compressed, *not 3-ribbed*, the dorsal angle usually almost or quite lacking 20

20. Nut becoming *fuscous-brown* or almost black; leaf-blades and floral bracts *poorly developed* or absent (*lowland plants*, either tufted or \pm rhizomic), the spikelets mostly solitary and inclined to axis:

492. *S. cernuus* Vahl *Enum. Plant.* 2: 245 (1806).

S. arenarius Benth. *Flor. aust.* 7: 325 (1878), non Boeck. (1870);

S. psammophilus S. T. Blake in *Proc. roy. Soc. Qd* 51: 178 (1940).

Illust.: Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1100 (1931); Herter, *Flor. il. Uruguay* 1: fig. 642 (1943); Eaton in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 648 (1940); Fitch in Clarke, *Ill. Cyperaceæ* t. 47 fig. 1-2 (1909), as "*S. arenarius*".

Vern.: Nodding Club-rush (Low Club-rush, Grassy Club-rush). *Distr.*: Widespread and frequent on damp ground almost throughout Victoria (except the Far North-west), often maritime; all States, N.Z., and practically cosmopolitan (except in S.E. Asia).

[The stout rhizomic form, adapted to wet maritime sands, is sometimes recognized as a distinct species *S. psammophilus* S. T. Blake. It is found at Wilson Promontory and Cape Conran in eastern Victoria, occurring also on the south coast of Western Australia.]

—Nut finally *grey*; leaf-blades and floral bracts *well developed* (strongly rhizomic *alpine plants*) 21

21. Floral bract solitary, stiff, erect, *shorter than* the culm, its broadly dilated base partly enclosing the *solitary*, often dark *purplish* spikelet; nut dark grey, with *slight dorsal angle*:

493. *S. aucklandicus* (Hook. f.) Boeck. in *Linnaea* 36: 491 (1870).

Isolepis aucklandica Hook. f. *Flor. antarct.* 1: 88 (1844), t. 50 (1845).

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Club-rush. *Distr.*: Frequent in boggy situations throughout the Victorian alps, from 4500 to 6500 ft. alt. (Lake Mtn., Baw Baws, Mts. Buller, Stirling, Cobbler, Buffalo, Feathertop & Hotham, Barry Mts., Bogong High Plains, Cobboras, Nunniong Plateau etc.); N.S.W., Tas., N.Z., Amsterdam Id, N.G. (Mt. Hagen at 11,000 ft.).

—Floral bracts 1 or 2, *longer than* the exceedingly short culm; spikelets solitary or 2-3 together, *greyish-brown* (never purplish), *usually hidden* among the much longer foliage; nut *not* dorsally angled:

494. *S. montivagus* S. T. Blake in *Proc. roy. Soc. Qd* 60: 46 (1949).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: Occasional in moist grassy situations of the Victorian alps (Mt. Buffalo, Bogong High Plains, Cobboras Mts.) where apparently endemic, but doubtless overlooked and extending at least to the adjacent Kosciusko massif in New South Wales.

22. Plant *rhizomic*, with *setaceous* vegetative parts; leaf-blades *well developed*, often exceeding the culms; spikelets usually *solitary* (less often 2-3 together); nut almost *as long as* glume, \pm *equally trigonous* and strongly angled:

495. *S. merrillii* (Palla) Kükenth. ex Merrill *Enum. philipp. Plant. I*: 117 (1922).
Schænoplectus merrillii Palla in *Allg. bot. Z.* 17: Beil. 3 (1911).

Illust.: Nil.

Vern.: Salaisoi (Philippine name). *Distr.*: Widespread in damp shady places of the eastern highlands in Victoria (e.g. Dandenongs, Beenak, Baw Baw plateau, Mts. Buller & Buffalo, Bogong High Plains, Cobboras, Upper Delegate R., Lower Bendoc etc.); N.S.W., Qd, Tas., N.Z., N.G., Philippines.

—Plant *tufted*, rarely somewhat *rhizomic*; leaf-blades *poorly developed* or quite lacking; spikelets usually *several* (sometimes many) together; nut distinctly *shorter than* glume, sometimes \pm compressed

23. Nut *smooth* or slightly granular, sometimes biconvex and the style-branches 2; culms often $>6''$ high (sometimes >1 ft.); *proliferous off-shoots* commonly arising from the inflorescence:

496. *S. inundatus* (R. Br.) Poir. in *Encycl. méth. (Bot.)* 13: 103 (1817).
Isolepis inundata R. Br. *Prodr. Flor. Nov. Holl.* 222 (1810).

Illust.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 144, col. (1859), as "*Isolepis prolifer*".

Vern.: Swamp Club-rush. *Distr.*: Widespread in wet, and often shaded, places throughout the lowlands of Victoria, but rare (if present at all) in the Far North-west; all States except W.A., Norfolk Id, N.Z., S. Amer., Malaysia.

[The var. *floribundus* Benth. *Flor. aust.* 7: 330 (1878) is frequent in the eastern highlands. It is only 1-3" high, *densely tufted*, with wholly green and congested, but *never proliferous*, inflorescence. A very robust condition, sometimes with spikelets *all* transformed into proliferating shoots, is not uncommon in southern and western Victoria; it has been distinguished as forma *urvillei* (Steud., ut *Isolepis* sp.) Kükenth.]

—Nut with numerous *irregular longitudinal ridges* and finer intervening transverse wrinkles; culms <6" high and the inflorescence not or rarely proliferous:

497. *S. wakefieldianus* S. T. Blake in *Proc. roy. Soc. Qd* 60: 45 (1949).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: In Victoria known only from damp places at Healesville and the Cann River district (type locality) in E. Gippsland; also Tas.

[*S. wakefieldianus* appears to combine the characteristics of *S. inundatus* and *S. calocarpus* (q.v.), and may comprise a hybrid population.]

24. Stamens 3; nut >0.5 mm. long, \pm *globular*, becoming *blackish and shiny* 28

Stamen 1; nut never as above 25

25. Nut *acutely triquetrous*, finally becoming *dull black*; apices of glumes with acute points *exceeding the wings* and *very divergent* (spikelets usually numerous in each cluster):

498. *S. stellatus* C. B. Clarke in *Kew Bull. Add. Ser.* 8: 29 (1908).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 210 (1943).

Vern.: Star Club-rush. *Distr.*: Occasional in moist sandy depressions of north-western and southern Victoria (Dimboola, Big Desert N. of Serviceton, Grampians, Cheltenham, etc.), N.S.W., S.A.

—Nut *not* becoming black; apices of glumes *not* or hardly exceeding the wings and only slightly spreading (culms to 5" high) 26

26. Wings of glumes broad, *hyaline*, with conspicuous *broad cells*; nut *silver-grey* in colour, *acutely triquetrous*, the 3 faces *concave*:

499. *S. congruus* (Nees) S. T. Blake in *Proc. roy. Soc. Qd* 48: 90 (1937).

Isolepis congrua Nees in *Lehm. Plant. Preiss.* 2: 75 (1846).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: Rare in Victoria where known only from damp sandy ground at Mt. Arapiles and "Lowan Shire"; S.A., W.A.

—Wings of glumes with *narrow-oblong cells*, *not* hyaline; nut *not* as above 27

27. Nut almost *globular*, *pale grey*, with *raised surface-cells*; spikelets normally 3-5 mm. long, *without reddish markings*; culms \pm *erect*:

500. *S. victoriensis* N. A. Wakefield in *Vict. Nat.* 73: 163 (1957).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: Apparently endemic in Victoria, where scattered in damp open places of northern, central and western districts (Mooroopna, Cohuna, Werribee, Creswick, Donald, Dimboola); but possibly extending to adjacent parts of New South Wales and South Australia.

—Nut *triquetrous*, the 3 faces \pm *flat*, normally *longer than wide*, finally *pale orange* in colour; spikelets 2-3 mm. long, usually *marked with red* or *purple tinted*; culms very numerous and *spreading*:

501. *S. australiensis* (Maiden & Betche) S. T. Blake in *Proc. roy. Soc. Qd* 51: 179 (1940).

S. cernuus Vahl var. *australiensis* Maiden & Betche in *Proc. Linn. Soc. N.S.W.* 33: 316 (1908).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: Damp sandy soil in Mallee, e.g. near edge of lakes or river-lagoons, and in Victoria known only by collections from Dimboola, Wyperfeld Nat. Park and Lake Hattah (in Kulkyne National Park); N.S.W., Qd, S.A.

28. Nut beautifully ornamented with numerous *longitudinal ribs* and fine intervening *transverse wrinkles* or trabeculæ; leaf-blades *very short* or obsolete:

502. *S. calocarpus* S. T. Blake in *Proc. roy. Soc. Qd* 51: 179 (1940).

S. setaceus sens. Ewart *Flor. Vict.* 219 (1931), atque auctt. Aust. al., non L. (1753).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: Frequent on damp ground of the lowlands almost throughout Victoria, except in the Far North-west and Far North-east; all States.

—Nut minutely reticulated with a hexagonal cell-pattern, but *without* vertical ribs and intervening trabeculæ; leaf-blades short but *well developed*:

503. *S. platycarpus* S. T. Blake in *Proc. roy. Soc. Qd* 51: 180 (1940).

Illust.: Nil.

Vern.: Club-rush. *Distr.*: Widespread and rather frequent on inundated ground of the Victorian lowlands (e.g. Lake Hattah, Katyl, Dimboola, Upper Glenelg R., Grampians, Ballarat, Cann R.); all States except Qd, N.Z.

174. ELEOCHARIS R. Br. (1810)

[Incorrectly spelt "*Heleocharis*" by Bentham and other Australian authors.]

1. Culms *stout* (4-12 mm. wide), to 5 ft. high, transversely *septate*; spikelet *narrower* than culm, 1-2" long; nut 2-2.5 mm. long, the persistent style-base \pm acuminate; hypogynous bristles 8-10, at least as long as nut (with style-base):

504. *E. sphacelata* R. Br. *Prodr. Flor. Nov. Holl.* 224 (1810).

Illust.: Blake, *Proc. roy. Soc. Qd* 50: t. 8 fig. 1-5 (1939); Brown in Clarke, *Ill. Cyperaceæ* t. 34 fig. 1-6 (1909); Payne in Bailey, *Weeds & susp. poison. Plant.* Qd fig. 366 (1906).

Vern.: Tall Spike-rush (Kaya). *Distr.*: Widespread in fresh-water swamps, along waterways and lakes almost throughout lowland Victoria, except the Far North-west; all States except W.A., N.A., N.Z.

—Culms <4 mm. wide, *not* septate; spikelet *broader* than culm, <1" long; nut <2 mm. long

2. Culms mostly <4" high; spikelet 2-7 mm. long; leaf-sheaths *hyaline* or withered at apex, *not mucronate* 5
Culms mostly >4" high; spikelet usually 5-20 mm. long; uppermost leaf-sheath *thickened and darker* at the orifice, often mucronate 3
3. Uppermost leaf-sheaths with *oblique orifice*, usually *not mucronate*; spikelet usually <1 cm. long; nut *trigonus*; style-base *narrowly pyramidal* (culms <1 ft. high):

505. *E. gracilis* R. Br. *Prodr. Flor. Nov. Holl.* 224 (1810).

Heleocharis multicaulis sens. Ewart *Flor. Vict.* 224 (1931), *atque auctt. Aust. plur., non Sm.* (1824).

Illust.: Blake, *Proc. roy. Soc. Qd* 50: t. 9 fig. 16-22 (1939); Ewart, *Flor. Vict.* fig. 128 & 129 (1931), as "*Heleocharis multicaulis*".

Vern.: Slender Spike-rush. *Distr.*: Scattered in damp places almost throughout lowland Victoria, except the far western and far north-western (Mallee) districts (e.g. Mt. Langi Ghiran, Hawkesdale, Mt. Macedon, Taggerty, Alexandra, Gobur, Sarsfield, Delegate R., Cann R., Genoa); N.S.W., S.A., Qd, Norfolk Id, N.Z.

—Uppermost leaf-sheaths *truncate and mucronate*; spikelets mostly 1-2 cm. long; nut *biconvex*; style-base *ovate-triangular*, often depressed (culms usually >1 ft. high, often tall) 4

4. Rhizome *slender*; spikelet usually *dark brown*; glumes *tardily deciduous*; margins of nut *thin*:

506. *E. acuta* R. Br. *Prodr. Flor. Nov. Holl.* 224 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 216 (1943); Blake, *Proc. roy. Soc. Qd* 50: t. 10 fig. 1-7 (1939); Purdy in Svenson, *Rhodora* 41: t. 538 fig. 2 (1939).

Vern.: Common Spike-rush. *Distr.*: Widespread and abundant in wet places and along watercourses throughout lowland Victoria (from the Lower Glenelg R. and Far North-west to Mallacoota); all States, Norfolk Id, N.Z.

—Rhizome *very short* or absent; spikelet usually *pale*; glumes *readily deciduous*; margins of nut *prominently thickened*:

507. *E. pallens* (Benth.) S. T. Blake in *Proc. roy. Soc. Qd* 49: 154 (1938).

Heleocharis acuta var. *pallens* Benth. *Flor. aust.* 7: 295 (1878).

Illust.: Blake, *Proc. roy. Soc. Qd* 50: t. 10 fig. 12-19 (1939); Purdy in Svenson, *Rhodora* 41: t. 538 fig. 1 (1939).

Vern.: Pale Spike-rush. *Distr.*: Very rare, if not extinct, in Victoria where known only by a single collection (from "dried-out flooded places" along the Avoca River, Dec. 1853); drier parts of all States except Tas., N. & Cent. Aust.

5. Glumes <2 mm. long; stamens 2; style 2-fid, the persistent base small ($\pm \frac{1}{2}$ the width of nut); nut *dark greenish-brown, biconvex*, minutely and roughly *reticulated*; hypogynous bristles 5-7, about *as long as nut*:

508. *E. minuta* Boeck. in Engler *Bot. Jb.* 5: 503 (1884).

Illust.: Blake, *Proc. roy. Soc. Qd* 50: t. 10 fig. 34-37 (1939); Purdy in Svenson, *Rhodora* 41: t. 541 fig. 4 & 5, 8 (1939).

Vern.: Variable Spike-rush. *Distr.*: Very localized and rare in Victoria where known only from the mouth of Yarra R. near Port Melbourne (Dec. 1891, Feb. 1892, Dec. 1894, Mar. 1895); N.S.W., Qd, Socotra, E. Afr., Madagascar, Mauritius.

—Glumes \pm 2 mm. long; stamens 3; style 3-fid, the persistent base *small* ($\frac{1}{4}$ to $\frac{1}{2}$ the width of nut); nut *pale*, obscurely *trigonous*, with 9-12 minute *longitudinal ribs* and fine intervening *trabeculæ*; hypogynous bristles *very small or absent*:

509. *E. pusilla* R. Br. *Prodr. Flor. Nov. Holl.* 225 (1810).

Heleocharis acicularis sens. Ewart *Flor. Vict.* 223 (1931), atque auctt.
Aust. plur., *non* (L.) Roem. & Schult. (1817).

Illust.: Blake, *Proc. roy. Soc. Qd* 50: t. 8 fig. 14-19 (1939); Purdy in Svenson, *Rhodora* 41: t. 539 fig. 2 (1939).

Vern.: Small Spike-rush. *Distr.*: Scattered from central and western to far north-western Victoria, in open wet places (Bacchus Marsh, Creswick, Mt. Emu Ck, Hawkesdale, Dimboola, Swan Hill, Kulkyne Nat. Forest, Nathalia); all States except W.A., N.Z.

—As for the last, but glumes 3-5 mm. long, style-base *large* (at least $\frac{1}{2}$ the width of nut) and stolons *bearing tubers*:

510. *E. atricha* R. Br. *Prodr. Flor. Nov. Holl.* 225 (1810).

Illust.: Blake, *Proc. roy. Soc. Qd* 50: t. 8 fig. 20-24 (1939).

Vern.: Tuber Spike-rush. *Distr.*: In Victoria known only from the Beechworth district (June 1950); N.S.W., Qd.

175. FIMBRISTYLIS Vahl (1806)

Tufted *perennial* 6-12" high; culms naked, much *longer than* leaves; spikelets 2-5-4 mm. wide (often subglobose); nut white, \pm balloon-shaped, with several *prominent longitudinal ribs* and numerous finer cross-bars; style-base *glabrous*:

511. *F. dichotoma* (L.) Vahl *Enum. Plant.* 2: 287 (1806).

Scirpus dichotomus L. *Spec. Plant.* 1: 50 (1753);

F. diphylla (Retz., ut *Scirpus* sp.) Vahl *Enum. Plant.* 2: 289 (1806).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 214 (1943); Herter, *Flor. il. Uruguay* 1: fig. 674 (1943); Makino, *Ill. Flor. Jap.* 772 (1924) Schönland, *Mem. bot. Surv. S. Afr.* 3: t. 27 (1922); Fitch in Clarke, *Ill. Cyperaceæ* t. 42 fig. 1-4 (1909)—all as "*F. diphylla*"; Reichenbach, *Icon. Flor. germ.* 8: t. 315 fig. 733, col. (1846).

Vern.: Common Fringe-rush. *Distr.*: In Victoria confined to damp situations of the Murray Valley and north-east, and rarely observed (Moglonemby between Euroa and Arcadia, "Murray R."); all States except Tas., N. & Cent. Aust., N.G. and almost cosmopolitan through warmer regions of the world.

—Tufted *annual*, rarely exceeding 6" (often only 2-3" high); culms not or only slightly exceeding leaves (seldom twice as long); spikelets 2 mm. wide or less 2-5-3-5 mm. long; nut creamy, *smooth* or only microscopically reticulate; style-base *glabrous* or almost so, very readily deciduous:

512. *F. æstivalis* (Retz.) Vahl *Enum. Plant.* 2: 288 (1806).*Scirpus æstivalis* Retz. *Obsns bot.* 4: 12 (1786).*Illust.*: Black, *Flor. S. Aust.* ed. 2: fig. 213 (1943); Makino, *Ill. Flor. Jap.* 773 (1924); Fitch in Clarke, *Ill. Cyperaceæ* t. 41 fig. 14-15 (1909).*Vern.*: Summer Fringe-rush. *Distr.*: Not uncommon in northern Victoria, on river-flats subject to flooding (Nangiloc near Red Cliffs, Kerang, Goulburn R., King R., Ovens R.); all States except Tas., N.A., N.G., south-eastern & southern Asia.

—As for the last, but spikelets *larger* (4-5 mm. long) and style-base with *numerous long hairs* hanging over the nut (on which it tends to persist):

513. *F. squarrosus* Vahl *Enum. Plant.* 2: 289 (1806).*Illust.*: Makino, *Ill. Flor. Jap.* 773 (1924); Osten, *An. Mus. nac. Montevideo* ser. 2, 3: t. 36 (1929); Fitch in Clarke, *Ill. Cyperaceæ* t. 41 fig. 8-10 (1909); Reichenbach, *Icon. Flor. germ.* 8: t. 315 fig. 735, col. (1846).*Vern.*: Veiled Fringe-rush. *Distr.*: Occasional on inundated ground of western and north-western Victoria (Antwerp, Wimmera R., Murray R. in Far North-west), with an isolated record for the Avon R. (East Gippsland); all States except Tas., N.A., N.Z., and scattered through most well-watered tropical and sub-tropical regions except N. Amer.**Tribe RHYNCHOSPOREÆ****176. *CARPHA* Banks & Soland. ex R. Br. (1810)**

Leaves 1.5-3 mm. wide; spikelets 10-15 mm. long; hypogynous bristles *plumose almost to the very tips*, body of nut 4-5 mm. long (culm up to 1 ft. long at maturity):

514. *C. nivicola* F. Muell. in *Trans. phil. Soc. Vict.* 1: 111 (1855).*C. alpina* sens. Ewart *Flor. Vict.* 211 (1931), atque auctt. Aust. al., *non* R. Br. (1810).*Illust.*: A. M. C., *Icon. Plant.* 13: t. 1216 (1877), as "*C. alpina*".*Vern.*: Broad-leaf Flower-rush (Alpine Flower-rush). *Distr.*: Scattered in fen and bog formations of the Victorian alps above 4500 ft. (Baw Baws, Mt. Wellington, Bogong High Plains where widespread and locally rather frequent); also N.S.W., on similar terrain in the Kosciusko region.

Leaves <1.5 mm. wide; spikelets 8-10 mm. long; hypogynous bristles merely *scabrid in the uppermost portion*, the plumose hairs ceasing abruptly; body of nut 3-4 mm. long (culm never exceeding 6-8", usually much less):

515. *C. alpina* R. Br. *Prodr. Flor. Nov. Holl.* 230 (1810).*Illust.*: Fitch in Clarke, *Ill. Cyperaceæ* t. 76 fig. 1-4 (1909).*Vern.*: Small Flower-rush. *Distr.*: Known with certainty in Victoria only by two collections—viz. the head of Diamantina R. near Mt. Hotham, at about 5500 ft. (Dec. 1914) and Mt. Baw Baw at 5000 ft. (Jan. 1960); also Tas., N.Z., N.G. (in alpine grassland above 11,000 ft. alt.).

177. CYATHOCHÆTA Nees in Lehm. (1846)

516. *C. diandra* (R. Br.) Nees in Lehm. *Plant Preiss.* 2: 86 (1846).
Carpha diandra R. Br. *Prodr. Flor. Nov. Holl.* 231 (1810).

Illust.: Nil.

Vern.: Sheath Rush. *Distr.*: In Victoria confined to the extreme south-east, on coastal heath between Mallacoota and the mouth of Betka R., but there not infrequent; also N.S.W. (at least as far north as the Port Jackson district).

Diagn.: Stoutly rhizomic perennial, fibrous at base; leaf-blades to 1 ft. long, 1-2 mm. wide, erect, rigid, flat or \pm concave, smooth or minutely scaberulous, acuminate, dull pale green, with prominent \pm scarious brown sheaths, passing into floral bracts with short blades (to 1" long); culms to 2 ft. high or more, almost terete, prominently sulcate-striate; panicle long, very narrow, erect, interrupted, with rather few narrow spikelets on pedicels of varying length (2-50 mm.); spikelet 15-20 mm. long, 1.5-3 mm. wide, with 1 bisexual flower and a male or sterile one below it; glumes 4-5, lanceolate, subequal, as long as spikelet, pinkish-brown, chaffy, acuminate or shortly aristate, the 2 lower always empty; nut narrow, \pm 10 mm. long, 1-1.5 mm. wide, almost terete but grooved along one side, smooth but microscopically scaberulous, reddish-brown, with thickened gynophore at base and crowned at apex by the persistent, slender, awn-like style-base (to 10 mm. long); style-branches 2, filiform; hypogynous bristles 4 (rarely to 6), capillary, barbellate to white-hairy at base, \pm 7-9 mm. long; stamens 2, rarely 3.

178. RHYNCHOSPORA Vahl (1806)

517. *R. brownii* Roem & Schult. *Syst. Veg.* 2: 86 (1817).

Illust.: Fitch in Clarke, *Ill. Cyperaceæ* t. 73 fig. 8-11 (1909), as "*R. glauca* var. *chinensis*".

Vern.: Grassy Beak-rush. *Distr.*: Known in Victoria by a single collection from Tawonga on the Kiewa R. (Apr. 1941), and perhaps casually adventive there; N.S.W., Qd, N.G., Philippines, Malaya, warmer parts of Asia.

Diagn.: Rhizomic perennial 1-2 ft. high; leaves grass-like, smooth, flat, slightly glaucous, acuminate, the radical ones 6-18" long and 2-4 mm. wide, passing gradually into leafy floral bracts 2-3" long; inflorescence of loose, irregular small, scattered, compound corymbs on slender angular culm, the ultimate branches almost capillary; spikelets shortly pedicellate, reddish-brown, 3-5 mm. long, with 1-2 bisexual and 1-2 male flowers; glumes 6-8, ovate, keeled, cuspidate, the lower empty 3-4 much shorter; nut pale brown, obovate to almost circular in outline, but much flattened and biconvex, 1.5-2 mm. long, sculptured by minute irregular transverse wrinkles, capped by a blunt, whitish, broadly conical, persistent style-base 0.5-1.0 mm. long, style-branches 2, long, slender, soon deciduous; hypogynous bristles normally 6, capillary, barbellate, \pm 1.5 mm. long.

179. SCHÆNUS L. (1753)

1. Inflorescence neither a solitary spikelet *nor* a single terminal group of spikelets—each group at a node of the inflorescence (or of the culm) and in the axil of a leaf or bract 9
- Inflorescence *terminal*—either a single spikelet, a single cluster of spikelets or 2-3 spikelets close together 2

2. Plant *aquatic, flaccid*, very rare; culms usually *elongated and floating*; leaves *filiform*; spikelet terminal, usually solitary, ± 1 cm. long:

518. *S. fluitans* Hook. f. *Flor. Tasm.* 2: 81 (1858), t. 141 fig. B, col. (1859).

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Floating Bog-rush. *Distr.*: Very rare in Victoria, where known by only a single collection from the Barwon River near Geelong (1883); also S.A., Tas. ("in stagnant brackish water"—*teste* C. Stuart).

—Plants *terrestrial*, \pm strong in habit, usually with erect culms 3

3. Leaves *not* exceeding the inflorescence; plants neither matted *nor* densely tufted 5

—Leaves $\pm 2''$ long, dense, much *longer than* culms which are hidden; spikelets usually 2 per culm (rarely 1 or 3), subtended by 2-3 leaf-like floral bracts (low rhizomic perennials, forming dense *tufts or mats*) 4

4. Spikelets ± 4 mm. long, 1-flowered; staminal filaments 5-7 mm. long (tufted plant of *alpine bogs*, the basal parts usually reddish-purple):

519. *S. calyptratus* Kükenth. in *Repert. Spec. nov. Regn. veg.* 48: 248 (1940).

Illust.: Nil.

Vern.: Alpine Bog-rush. *Distr.*: Frequent in bogs almost throughout the Victorian alps, less commonly in alpine herbfield (Lake Mountain, Baw Baws, Mts. Skene, Buller & Buffalo, Bogong High Plains etc.); also N.S.W. (at Mt. Kosciusko in the *Plantago muelleri*-*Montia australasica* alliance).

—Spikelets ± 10 mm. long, several-flowered; staminal filaments < 5 mm. long (matted plant of sandy western heathlands, *not* purplish on lower sheaths):

520. *S. breviculmis* Benth. *Flor. aust.* 7: 364 (1878).

Illust.: Nil.

Vern.: Matted Bog-rush. *Distr.*: Abundant on sandy heaths in the Big and Little Deserts of far western Victoria, Black Range south of Horsham, Victoria Range, and Great Ocean Road between Torquay and Anglesea (an isolated occurrence); S.A., W.A.

5. Spikelet *solitary*, narrow, blackish, ± 10 mm. long, with *one* fertile flower; culms very slender, wiry, 4-12" high, leafless except for basal sheaths:

521. *S. tenuissimus* Benth. *Flor. aust.* 7: 365 (1878).

Chaetospora tenuissima F. Muell. ex Hook. f. *Flor. Tasm.* 2: 81 t. 140 fig. B, col. (1858), *non* Steud. (1855).

Illust.: Fitch in Hooker f. (*l.c.*); Fitch in Clarke, *Ill. Cyperaceæ* t. 80 fig. 3-9 (1909).

Vern.: Slender Bog-rush. *Distr.*: Widespread and rather common, chiefly on near-coastal heaths, throughout southern Victoria, from the Lower Glenelg R. to Mallacoota (e.g. Grampians, Brisbane Range, Anglesea, eastern Port Philip, Plenty Ranges, Quail Id in Western Port, Sunday Id, Wilson Prom.); Tas., S.A., N.S.W.

—Spikelets usually in a cluster (rarely solitary), <8 mm. long, each normally with >1 fertile flower 6

6. Leaf-blades *obsolete*; hypogynous bristles *absent* 8

—Leaf-blades *present*; hypogynous bristles 6 7

7. Rhizomic *perennial*, usually several inches high; spikelets *ovate*, usually *blackish*, \pm *lateral*, 1- to 3-flowered:

522. *S. nitens* (R. Br.) Poir. in *Encycl. méth. Bot. Suppl.* 2: 252 (1811).

Chaetospora nitens R. Br. *Prodr. Flor. Nov. Holl.* 233 (1810).

Illust.: Nil.

Vern.: Shiny Bog-rush. *Distr.*: Frequent in Victoria on damp, sandy, usually \pm saline flats on and near the coast, from the Lower Glenelg R. to Mallacoota (e.g. Port Fairy, Torquay, Port Phillip Bay, Phillip & Quail Is, Wilson Prom., Sperm Whale Head, Cape Conran, Ram Head), with more isolated and scattered inland occurrences near Dimboola, along Mt. Emu Ck and at Lake Omeo; all States, N.Z., N.G. (near Mt. Wilhelmina, at 11,000 ft.).

—*Annual*, 1-2" high; spikelets narrow-lanceolate, 3- or 4-flowered (rare plant of far western Victoria):

523. *S. nanus* (Nees) Benth. *Flor. aust.* 7: 364 (1878).

Chaetospora nana Nees in Lehm. *Plant. Preiss.* 2: 85 (1846).

Illust.: Nil.

Vern.: Tiny Bog-rush. *Distr.*: Known in Victoria only by a single collection from Mt. Arapiles (Oct. 1894), but perhaps overlooked on account of its resemblance to diminutive states of the abundant *S. apogon*; also S.A. (Golden Grove and very rare), W.A.

8. Spikelets *brown*, *straight*, in a *dense* capitate cluster; stamens usually 4-6 (desert plant):

524. *S. subaphyllus* Kükenth. in *Repert. Spec. nov. Regn. veg.* 44: 7 (1938).

S. aphyllus Boeck. in *Linnæa* 38: 280 (1874), *non* Vahl (1806).

Illust.: Nil.

Vern.: Desert Bog-rush (Leafless Bog-rush). *Distr.*: Almost restricted in Victoria to drier Mallee districts, where not uncommon on sand-hills in many parts of the Far North-west (including Kulkyne Nat. Forest), in the Hopetoun-Woomelang district and with an isolated occurrence at the Victoria Range (western Grampians), but apparently not extending to either the Little Desert or more southerly parts of Big Desert; sandy interior of all mainland States.

—Spikelets *black*, usually *curved*, in a *loose* cluster; stamens 3 (plant of far eastern Victoria):

525. *S. imberbis* R. Br. *Prodr. Flor. Nov. Holl.* 231 (1810).

Illust.: Nil.

Vern.: Beardless Bog-rush. *Distr.*: Restricted in Victoria to coastal heaths of East Gippsland where scattered and uncommon (Seacombe near Lake Wellington, Sperm Whale Head, Betka R. mouth, Mallacoota); also N.S.W., extending from the coast inland to Dividing Range.

9. Leaf-blades *well developed*; clusters of spikelets (at least the lower ones) *shorter than* blade of the subtending leaf or bract 11

—Leaf-blades *obsolete* (reduced to short points 1 cm. long or less); inflorescence an *elongated panicle*, each cluster of spikelets loose and branched and *much exceeding* the free point of the subtending bract (hypogynous bristles minute or none) 10

10. Culms usually 1-2 ft. high, the sheathing scales *glabrous*; spikelets 8-10 mm. long, 3- to 5-flowered, their rhachillas very flexuose (zig-zagging):

526. *S. brevifolius* R. Br. *Prodr. Flor. Nov. Holl.* 231 (1810).

Illust.: Nil.

Vern.: Zig-zag Bog-rush (Short-leaf Bog-rush). *Distr.*: Widespread and frequent on near-coastal heaths of southern Victoria between the Lower Glenelg R. and Mallacoota (e.g. Grampians, Anglesea, eastern shores of Port Phillip Bay, French Id, Tonimbuk, Wilson Prom., Stradbroke near Ninety-mile Beach, Marlo, Reedy Ck near Cann R.); Tas., N.S.W., Qd, ? W.A., N.Z., N. Cal.

—Culms often several feet long, the sheathing scales \pm *bearded* at the orifice; spikelets usually \pm 6 mm. long and 1- to 2-flowered (plant of far eastern Victoria):

527. *S. melanostachys* R. Br. *Prodr. Flor. Nov. Holl.* 231 (1810).

Illust.: Nil.

Vern.: Black Bog-rush. *Distr.*: Confined in Victoria to near-coastal, boggy situations in the far east, but locally common (Cann R., Reedy Ck, Tonghi plains, Genoa Ck, Genoa R., Mallacoota); N.S.W., Qd, N. Borneo, Philippines, ? Bonin Is.

11. Culms *prostrate or ascending*, leafy throughout, <6" long; spikelets 1-3 together in the upper axils, 2-3 mm. long, 1- or 2-flowered:

528. *S. maschalinus* Roem. & Schult. *Syst. Veg.* 2: 77 (1817).

S. axillaris (R. Br., ut *Chaetospora* sp.) Poir. in *Encycl. méth. Bot.* Suppl. 2: 251 (1811), *non* Lam. (1791).

Illust.: Fitch in Clarke, *Ill. Cyperaceæ* t. 80 fig. 1-2 (1909), as "*S. axillaris*".

Vern.: Leafy Bog-rush (Dwarf Bog-rush). *Distr.*: Widespread in Victoria and rather frequent in damp, often shaded places from sea-level to the alps, but absent from Mallee and northern plains (e.g. Lower Glenelg R., Grampians, Mt. Cole, Otways, Frankston, Dandenongs, Kinglake Nat. Park, Cathedral Range, sources of Yarra, Latrobe, Toorongo and Bunyip Rivers, Quail Id, Tarwin R., Wilson Prom., Sarsfield, Orbost, Brodribb R., Tonghi Plains, Genoa R., Bogong High Plains); all States, N.Z., Chatham Id, N.G., ? Philippines.

—Culms *erect*; leaves *basal*; spikelets 4 mm. long or more 12

12. *Annual*, the culms *without* nodes below inflorescence; spikelets *pale*, 1-3 together in the axils of bracts; nut *coarsely reticulate* and pitted; hypogynous bristles minute or none:

529. *S. latelaminatus* Kükenth. in *Repert. Spec. nov. Regn. veg.* 44: 88 (1938).
S. sculptus sens. Ewart *Flor. Vict.* 237 (1931), *non* Boeck. (1874).

Illust.: Nil.

Vern.: Medusa Bog-rush (Gimlet Bog-rush). *Distr.*: Scattered through western and north-eastern Victoria in open, temporarily damp places, but uncommon and seldom collected (Wimmera, Grampians, Hawkesdale, You Yangs, Arthur's Seat near Bendigo, Graytown, Gooram near Euroa, Lake Winton, Boweya, Mt. Pilot near Beechworth); also N.S.W., Tas. (at Epping and rare).

—*Perennials*, with 1 or more *nodes* below the inflorescence; spikelets *blackish*; nut *smooth* or almost so

13. Culms 1- to 3-noded below the inflorescence; nut very *finely reticulate*; hypogynous bristles 6, about *as long as* the nut:

530. *S. apogon* Roem. & Schult. *Syst. Veg.* 2: 77 (1817).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 205 (1943); Makino, *Ill. Flor. Jap.* 742 (1924); Engler & Drude, *Veg. Erde* 7: 256 (1906).

Vern.: Common Bog-rush (Fluke Bog-rush). *Distr.*: The most widespread and abundant species of *Schænus* in Victoria, occurring almost everywhere except in the higher alps, shady mountain-forests and drier parts of the Mallee (e.g. such dispersed localities as Lower Glenelg R., Little and Big Deserts, Grampians, Mt. Cole, Charlton, Bendigo, Creswick, Brisbane Range, Otways, Bellarine Penins., Melbourne area, Dandenongs, Arthur's Seat, Western Port, Wilson Prom., Graytown, Yea, Euroa, Mansfield, Howqua, Mitta Mitta, Limestone Ck, Cobboras, Suggan Buggan, Upper Delegate R., Genoa R., Howe Range, and in many intervening places); all States except W.A., also N.Z., N.G., Japan.

—Culms with a single node between base and inflorescence; nut quite *smooth*; hypogynous bristles *minute or none* (plant of far western Victoria):

531. *S. tesquorum* J. M. Black in *Trans. roy. Soc. S. Aust.* 46: 565 (1922).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 203 (1943).

Vern.: Bog-rush. *Distr.*: In Victoria known only from Heathmere near Portland, the Victoria Range (western Grampians) and the southern fringe of Little Desert south of Nhill, but perhaps confused with the very common *S. apogon* and actually of wider range in the far west of the State; also S.A. (south-eastern).

180. TETRARIA Pal. Beauv. (1812)

532. *T. capillaris* (F. Muell.) J. M. Black in *Trans. roy. Soc. S. Aust.* 58: 169 (1934).

Chaetospira capillaris F. Muell. *Fragm. Phyt. Aust.* 9: 34 (1875);

Cladium capillaceum C. B. Clarke in Cheesman *Manual N.Z. Flor.* 789 (1906).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 207 (1943); Fitch in Hooker f., *Flor. Tasm.* 2: t. 141 A, col. (1859), as "*Chaetospira capillacea*".

Vern.: Hair-sedge (Bristle Twig-rush). *Distr.*: Widespread in swampy (and usually near-coastal) heaths of southern Victoria, from the Lower Glenelg R. to Howe

Ranges (e.g. Grampians and Black Range, Curdie's Inlet, Otways, Olinda, Arthur's Seat, Tonimbuk, Wilson Prom., Reedy Ck, Mallacoota, Maramingo Ck), but seldom abundant and usually of scattered occurrence; all States except W.A. (?), also N.Z.

Diagn.: Slender, sometimes tussock-forming, rhizomic perennial about 1 ft. high; leaves basal, reduced to the smooth rubescent sheaths or with short, almost setaceous, ciliate lamina to 7 mm. long: culms almost capillary (0.3-0.5 mm. wide), numerous, flaccid, smooth, terete but grooved along one side, light vivid green; panicle terminal, extremely short (<1" long, often much less), consisting of few (1-8) shortly stalked spikelets close together; spikelet 3.5-6 mm. long, < 1 mm. wide, lanceolate until mature, reddish-brown, with 1 or 2 flowers but only the upper fertile; glumes smooth, almost distichous, about 6, mostly acute, the 3-4 outer empty ones shorter and more obtuse, the upper ones ciliate on margins; nut \pm ellipsoid, turgid, smooth, constricted below the high, conical, scabrid and persistent style-base, the whole structure 3.4-5 mm. long (half being style-base); hypogynous bristles rudimentary or absent; style-branches 3; anthers 3, prominent at anthesis, 4.5 mm. long.

181. CLADIUM P. Browne (1756)

1. Leaves *grass-like*, flat-bladed, with sharply *denticulate* margins and keels; culms 3-6 ft. high, *several-noded*; inflorescence to 1 ft. long, dense, broad, leafy; nut ovoid, \pm 3 mm. long, pale brown, smooth and shining:

533. *C. procerum* S. T. Blake in *Trans. roy. Soc. S. Aust.* 67: 57 (1943).

C. mariscus sens. Ewart *Flor. Vict.* 239 (1931), atque auctt. Aust. plur., *non* (L.) Pohl (1809).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 221 (1943), as "*C. mariscus*".

Vern.: Leafy Twig-rush (Tall Twig-rush). *Distr.*: Scattered and occasional along waterways of southern Victoria, at or near the coast and often within tidal influence (Lower Glenelg R., Lower Bridgewater near Portland, Port Fairy, Tower Hill near Warrnambool, Aire R. in Otways, mouth of Yarra R. where now presumed extinct, Bairnsdale, Orbost, Lake Curlip); all States except Tas. (?), also N. Cal.

—Leaves neither grass-like *nor* denticulate, sometimes absent; culms *not* several-noded. 2

2. Leaves stout, cylindrical, hollow, with *prominent transverse partitions*; culms 3-6 ft. high; inflorescence \pm 1 ft. long (sometimes longer), moderately loose, *drooping*, with very numerous spikelets; nut trigonous, 5 mm. long:

534. *C. articulatum* R. Br. *Prodr. Flor. Nov. Holl.* 237 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 222 (1943); Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 475 (1915).

Vern.: Jointed Twig-rush. *Distr.*: Widespread and not uncommon beside water-courses in the cooler lowlands of western and southern Victoria, often growing against deep water (e.g. Lower & Upper Glenelg R., Wimmera R. near Dimboola, Grampians, Lake Terang, Ballarat, Yarra R., Merton, Wilson Prom., Bairnsdale, Orbost, Brodribb R., Cann R., Wangrabelle); S.A., N.S.W., Qd, N.Z., N. Cal., Polynesia.

—Leaves prominently and *equally 4-angled*, not septate; culms rather slender, 1-3 ft. high; panicle 2-4" long, rather dense, reddish-brown, *erect*; nut about 2 mm. long, indistinctly 3-ribbed but *irregularly rugose*:

535. *C. tetragonum* (Labill.) J. M. Black *Flor. S. Aust.* 95 (1922).

Lepidosperma tetragonum Labill. *Nov. Holl. Plant. Specim.* 1: 17, t. 17 (1805).

Illust.: Labillardière (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 224 (1943); Fitch in Hooker f., *Flor. Tasm.* 2: t. 149, col. (1859), as "*C. tetraquetrum*".

Vern.: Square Twig-rush. *Distr.*: Scattered through the cooler lowlands of Victoria, except the Mallee and Murray Valley, usually in swampy tracts and locally frequent (e.g. Wannon R., Grampians, Stawell, eastern heaths of Port Phillip, Cranbourne, Pakenham, Warburton, Goulburn R., Myrtleford, Newton's Ck, Reedy Ck near Cann R., Genoa); all States except W.A., but restricted in Qd to the Far South-east bordering N.S.W. (e.g. Wallangarra district).

[The var. *planifolium* (Benth., ut *C. tetraquetrum* var.) Ewart *Flor. Vict.* 240 (1931) differs in having *very unequally 4-angled* leaves (almost flat, but with a prominent midrib on each side). It is known in Victoria from the Grampians, Goulburn R., Kithbrook near Euroa, Shelley and Upper Murray R., extending to the New England district in far N.E. New South Wales.]

—Leaves neither prominently septate *nor* 4-angled, round to elliptical in section or flattened (but without any midrib), the blades occasionally much reduced 3

3. Foliage *reed-like* (rounded or \pm compressed, with loose pith) *or* reduced to small scale-like points. 5

—Foliage (and culms) *very flat* and thin 4

4. Culms and leaves with *obtuse* margins, 1-2 mm. wide; panicle *short* (<2" long), rather *dense*; nut \pm 2 mm. long, *ovoid*, with large, pyramidal, *glabrous* style-base (plant in aspect strongly resembling a small species of *Lepidosperma*):

536. *C. acutum* (Labill.) Poir. in *Dict. Sci. nat.* 9: 344 (1817).

Schænus acutus Labill. *Nov. Holl. Plant Specim.* 1: 18, t. 18 (1805).

Illust.: Labillardière (*l.c.*).

Vern.: Pale Twig-rush. *Distr.*: Frequent on damp sandy heaths of western and southern Victoria, usually not far from the coast, but seldom collected in East Gippsland where apparently less common (Lower Glenelg R., Casterton district, Black Range, Grampians, between Curdie's and Gellibrand Rivers, Lorne, Brisbane Range, eastern heaths of Port Phillip, Arthur's Seat, Upper Beaconsfield, Tonimbuk, French Id, Wilson Prom.); N.S.W., Tas., S.A., ? W.A.

—Culms and leaves with *acute* edges, up to 8 mm. wide; panicle 6" long or more, occupying $\pm \frac{1}{2}$ the length of plant, *very loose*, with attenuated, \pm capillary branches and scattered spikelets; nut 2-2.5 mm. long, prominently *trigonus*, with short \pm *hispid* style-base (plant of extreme south-west Victoria):

537. *C. laxum* (Nees) Benth. *Flor. aust.* 7: 405 (1878).

Chapelliera laxa Nees in Lehm. *Plant Preiss.* 2: 76 (1846).

Illust.: Nil.

Vern.: Lax Twig-rush. *Distr.*: Extremely localized in Victoria where known only from the Far South-west—in very wet situations near Long Swamp at the mouth of the Glenelg R. and at Johnstone's Ck (\pm 20 miles south-easterly), the first collection having been made at the former locality in Oct. 1946; also S.A. and W.A.

5. Leaf-blades *well developed*, \pm *compressed*; panicle 2-5" long, dense; spikelets 3- to 5-flowered; glumes *ciliate*; nut trigonous, 2.5-3.5 mm. long, reddish, with depressed pubescent style-base:

538. *C. glomeratum* R. Br. *Prodr. Flor. Nov. Holl.* 237 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 223 (1943); Koorders, *Exkursionsflor. Java* 4*: 115 (1922).

Vern.: Soft Twig-rush. *Distr.*: Widespread and often frequent in open, damp, sandy places and along watercourses throughout most of lowland Victoria, but absent from the Mallee and northern plains (e.g. Lower Glenelg R., Portland, Wannon R., Dimboola, Little Desert, Moyston, Orford, Brisbane Range, Bellarine Penins., Frankston, Croydon, Tonimbuk, Mt. Disappointment, Strathbogie, Beechworth, Bright, Wilson Prom., Snowy R.); all States, N.Z., N. Cal., N.G., S. E. Asia.

—Leaf-blades *terete or reduced to small points*; spikelets 1-flowered; glumes *glabrous* or nearly so; nut 3.5-4 mm. long 6

6. Panicle *loose, elongated* (2-8" long); spikelets *few*, rather distantly scattered, *gaping widely* in fruit; nut *shining, obscurely 3-ribbed*; style-base *conical, glabrous*; leaf-blades sometimes present:

539. *C. gunnii* Hook. f. *Flor. Tasm.* 2: 95 (1858), t. 148 fig. B, col. (1859).

Illust.: Fitch in Hooker f. (l.c.); Black, *Flor. S. Aust.* ed. 2: fig. 225 (1943).

Vern.: Slender Twig-rush. *Distr.*: Scattered in swamps and along creeks throughout cooler parts of Victoria, but not alpine, and rather uncommon (Gorae West near Portland, Casterton district, Grampians, between Curdie's and Gellibrand Rivers, Buffalo Mts., Wilson Prom., Muddy Ck in S. Gippsland, Upper Delegate R.); Tas., S.A., N.S.W., ? Qd, N.Z.

—As for the last, but spikelets *numerous and close*, nuts *dull* and corrugated with several very irregular raised ribs, style-base *indistinct* and the long leaf-blades *always present*:

540. *C. teretifolium* R. Br. *Prodr. Flor. Nov. Holl.* 237 (1810).

Illust.: Domin, *Bibl. bot., Stuttgart* 20 (Heft 85): 474 (1915).

Vern.: Wrinkle-nut Twig-rush. *Distr.*: Known in Victoria by a single collection from Beechworth township (June 1950) and possibly a casual introduction there; N.S.W., Qd, N.Z., N.G. (Arfak Mts.).

[The writer has not examined the Victorian material, which was recorded by E. J. McBarron in *Contr. N.S.W. Herb.* 2: 137 (1955) as representing Kükenenthal's variety *asperrimum*.]

- Panicle *spike-like*, up to 2" long (rarely more); spikelets *few, crowded*, not gaping; style-base *depressed, pubescent*; leaves all *reduced to mucronate sheaths* on the greyish and 2- to 3-noded culms (rhizomes long-creeping, covered with large, chaffy, shining, *regularly distichous scales*; nut 4-ribbed, also \pm rugulose, somewhat shining):

541. *C. junceum* R. Br. *Prodr. Flor. Nov. Holl.* 237 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 226 (1943); Carpenter in Hamilton, *Proc. Linn. Soc. N.S.W.* 44: t. 30 fig. 28 (1919).

Vern.: Bare Twig-rush. *Distr.*: Widespread on damp sandy soils of heaths in western and southern Victoria, from the Lower Glenelg R. to Mallacoota, and frequent near the coast (e.g. Little Desert, Grampians, Poolaigelo, Anglesea, Bellarine Penins., Melbourne area where now becoming rare, Frankston, French and Quail Is, Wilson Prom., Sunday Id, Lakes Entrance, Cape Conran, Cann R. falls, Reedy Ck); all States, N.Z., ? N. Cal.

182. *GAHNIA* Forst. & Forst. f. (1776)

[Key adapted from that by G. Benl in *Bot. Arch.* 40: 159-163 (1940)].

1. Mature nut *never held* by the staminal filaments; culms <4 ft. high (sometimes 4-6 ft. in *G. radula*); at least the outer, and usually all, glumes *long-acuminate*; nut 2 mm. long or less, often dull or greyish 4
 —Mature nut *adhering* to the persistent staminal filaments; culms *stout*, >4 ft. high; glumes broadish, *never long-acuminate*; nut 2-4 mm. long, *shining* 2
2. Filaments *elongated*, much exerted beyond glumes and *intertwined* (but *not stuck together*); nut *black*; spikelet 1-flowered, \pm 4 mm. long (culms 4-8 ft. high, very leafy):

542. *G. melanocarpa* R. Br. *Prodr. Flor. Nov. Holl.* 239 (1810).

Illust.: Benl, *Bot. Arch.* 40: 196 fig. 12 (1940); Fitch in Clarke, *Ill. Cyperaceæ* t. 97 fig. 3-5 (1909).

Vern.: Black-fruit Saw-sedge. *Distr.*: Restricted in Victoria to damp shaded parts of East Gippsland, east from Bairnsdale, chiefly in the near-coastal jungle gullies where locally frequent (e.g. Bunga Ck and Toorloo Arm between Lakes Entrance & Nowa Nowa, Orbost district at Mt. Raymond etc., Murrungowar, Mt. Drummer, Genoa, Mallacoota, Howe Range); also rain-forests of N.S.W. & Qd (south-eastern), a record for Tas. being questionable.

- Filaments not or only slightly exerted, *gummed together* in their apical parts; nut *never black*, usually *vivid red* at maturity; spikelet 2-flowered, 5-8 mm. long 3
3. Glumes >12, *tightly imbricate*, all \pm *obtuse*, the lowermost *without awn-like points* (culms woody, attaining heights of 10-15 ft. and diameters of 2-3 cm., often perennial and palm-like with annular leaf-scars on the almost naked lower portions):

543. *G. clarkei* G. Benl in *Repert. Spec. nov. Regn. veg.* 44: 196, t. 247 (1938).
G. psittacorum sens. Ewart *Flor. Vict.* 248 (1931), non Labill. (1805).

Illust.: Benl (*l.c.*).

Vern.: Tall Saw-sedge. *Distr.*: Scattered in sheltered gullies throughout southern Victoria, from Lower Glenelg R. to Howe Range, but more frequent along the jungle streams of East Gippsland (e.g. Portland, Lake Condah, Hawkesdale, Curdie's R., Wilson Prom. & Sunday Id, near Orbost, Mt. Ellery, Mt. Kaye, Wingan Inlet, Karlo Ck); S.A. (near Rivoli Bay & Lake Bonney), N.S.W., Qd.

[The species has been confused in Victoria with *G. psittacorum* Labill. which has very long intertwined filaments (as in *G. melanocarpa*) and acutely-pointed nuts. *G. psittacorum* ranges from southern Tasmania through New South Wales and Queensland to Arnhem Land, and its absence from Victoria is astonishing.]

—Glumes up to 10 (the outer glumes usually 3-5), rather loosely imbricate, mostly acute and ovate-lanceolate, the lowermost with exserted awn-like midribs (culms seldom > 10 ft. high, < 1.5 cm. wide):

544. *G. sieberiana* Kunth *Enum. Plant.* 2: 332 (1837).
G. tetragonocarpa Boeck. in *Linnaea* 38: 347 (1874).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 951 (1952); Benl, *Bot. Arch.* 40: 224 fig. 21 (1940); Fitch in Clarke, *Ill. Cyperaceæ* t. 97 fig. 7-10 (1909)—all as "*G. tetragonocarpa*".

Vern.: Red-fruit Saw-sedge. *Distr.*: Frequent in damp cooler parts of Victoria from sea-level to the subalps, especially along watercourses in mountain-forest (e.g. Lower Glenelg R., Portland, Black Range, Grampians, Mt. Cole, Wombat Forest, Curdie's R., Otways, Dandenongs, Kinglake Nat. Park, Upper Yarra & Latrobe R. watershed, Arthur's Seat, Inverloch, foothills of Baw Baws, Mt. Buffalo, Upper Murray R., Upper Delegate R., Mt. Ellery, Genoa R., Howe Range); S.A. (Mt. Lofty, Myponga, Mt. Compass), N.S.W., Qd, N. Cal., N.G.

4. Spikelets 2-flowered, \pm loosely arranged and usually dark or blackish (plants usually removed from coast) 6

—Spikelets 1-flowered, densely clustered in a very compound, erect, pale brownish inflorescence \pm 1 ft. long (coastal or near-coastal plants) 5

5. Lower leaf-like bracts of inflorescence coarsely scabrid (with sharp forward-pointing teeth), green or slightly tinted below; smaller floral bracts \pm narrow, opaque or with narrow hyaline margins; stamens 4-6; nut blackish:

545. *G. trifida* Labill. *Nov. Holl. Plant. Specim.* 1: 89, t. 116 (1805).

Illust.: Labillardière (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 228 (1943); Benl, *Bot. Arch.* 40: 233 fig. 24 (1940).

Vern.: Coast Saw-sedge. *Distr.*: Scattered on damper coastal and near-coastal heaths of southern Victoria from Lower Glenelg R. to Snowy R, sometimes on slightly saline ground and often locally abundant (e.g. Portland, Grampians, French & Phillip Is, Foster, Wilson Prom., Albert R., Sperm Whale Head, Rigby Id at Lakes Entrance); all States except Qd.

—Lower leaf-like bracts of inflorescence *smooth* (or only minutely scabrid), conspicuously *reddish-purple* below; smaller floral bracts very *broad and chaffy*, with wide hyaline margins (except toward apices); stamens 3; nut pale brown:

546. *G. filum* (Labill.) F. Muell. *Key Syst. Vict. Plant.* 1: 456 (1888).
Schoenus filum Labill. *Nov. Holl. Plant. Specim.* 1: 18, t. 19 (1805);
Cladium filum (Labill.) R. Br. *Prodr. Flor. Nov. Holl.* 237 (1810).

Illust.: Labillardière (*l.c.*).

Vern.: Chaffy Saw-sedge (Thready Twig-rush). *Distr.*: Widespread and locally abundant on wet sandy ground of southern and western Victoria from Portland district to Mallacoota, usually near-coastal and often bordering salt-marshes (e.g. Dimboola, Grampians, Hawkesdale, Upper Barwon R., Torquay, Queenscliff, Seaholme, Tooradin, French & Phillip Is, Sunday Id, Rigby Id near Lakes Entrance, Ram Head, Wingan Inlet); S.A., Tas.

[G. Benl in *Bot. Arch.* 40: 230 (1940) treats this plant as a form of *G. trifida*, to which in general aspect and habitat it certainly bears a resemblance; but the present writer does not share his opinion, and considers *G. filum* a distinct specific entity.]

6. Inflorescence at least 2" wide, 1-2 ft. long, *blackish and often drooping*; spikelets 5 mm. long or more; nut \pm 1.5 mm. wide, broadly ellipsoid to almost globular (widespread plant with very scabrid foliage):

547. *G. radula* (R. Br.) Benth. *Flor. aust.* 7: 417 (1878).
Cladium radula R. Br. *Prodr. Flor. Nov. Holl.* 237 (1810).

Illust.: Fitch in Clarke, *Ill. Cyperaceæ* t. 96 fig. 8 (1909).

Vern.: Thatch Saw-sedge. *Distr.*: Widespread and frequent over much of Victoria, excepting the Mallee, basalt areas, northern plains and alps, ranging from coastal heaths to montane forest (e.g. in such dispersed localities as Lower Glenelg R., Poolaigelo, Little Desert, Grampians, Creswick & Daylesford, Otways, Brisbane Range, outer eastern suburbs of Melbourne, Dandenongs, Kinglake, Arthur's seat, Western Port, Wilson Prom., Lakes Entrance, Genoa Peak, Mt. Drummer, Gabo Id), but apparently localized in the north-east (e.g. Tolmie region between Mansfield & Whitfield); Tas., S.A., N.S.W., Qd (as far north as Bellenden Ker Range).

—Inflorescence <2" wide (usually <1"), *erect*; spikelets 3-4 mm. long; nut <1.5 mm. wide, ellipsoid

7. Leaves *glabrous*, the sheaths conspicuously *woolly-hairy at orifice*; inflorescence usually *blackish*, rather compact, <1 ft. long and often only 2-3" (frequent plant of Mallee sand-hills):

548. *G. lanigera* (R. Br.) Benth. *Flor. aust.* 7: 415 (1878).
Cladium lanigerum R. Br. *Prodr. Flor. Nov. Holl.* 237 (1810).

Illust.: Nil.

Vern.: Desert Saw-sedge (Little Sedge). *Distr.*: Widespread and locally frequent on Mallee sand-hills of the Big Desert and far north-western Victoria (including Kulkynne Nat. Park); S.A., W.A., ? N.S.W. (Far South-west).

—Leaves *scabrid* on margins, the sheaths *not* bearded; inflorescence *brown*, very *slender*, usually 1-2 ft. long (very rare mountain plant):

549. *G. microstachya* Benth. *Flor. aust.* 7: 414 (1878).*Illust.*: Benl, *Bot. Arch.* 40: 243 fig. 28 B, 248 fig. 29 A (1940).*Vern.*: Slender Saw-sedge. *Distr.*: Localized and very rare in Victoria where known by only two collections, a century apart—viz. drier high parts of the "Avon Ranges" (Syntype, Nov. 1854), and Mt. William in the Grampians (Feb. 1951); also N.S.W. (Blue Mtns. and tablelands north of Bathurst).183. *LEPIDOSPERMA* Labill. (1805)

1. Culms (and often the leaves) *terete or angular*, or, if slightly flattened, then always <1.5 mm. wide 10

—Culms and leaves *distinctly flattened*, the former nearly always (except in *L. lineare* which has only 2.5 spikelets) >1.5 mm. wide 2

2. Culms thick, *soft, pithy* and easily indented (sometimes hollowed), strongly biconvex, *without* sharp or cutting edges, 3 ft. long or more; spikelets crowded on branches of a long stiffly erect panicle, greyish-brown; subtending bract much shorter than the lowest panicle-branch:

550. *L. longitudinale* Labill. *Nov. Holl. Plant. Specim.* 1: 16, t. 13 (1805).*L. exaltatum* R.Br. *Prodr. Flor. Nov. Holl.* 234 (1810).*Illust.*: Labillardière (*l.c.*); Ewart, *Flor. Vict.* fig. 136 (1931).*Vern.*: Pithy Sword-sedge (Common Sword-sedge). *Distr.*: Frequent on swampy heaths and wet flats of southern Victoria, from the Glenelg R. to Cape Howe (e.g. Portland, Grampians, Brisbane Range, Port Phillip Bay, French Id, Wilson Prom., Port Albert, Marlo), extending to a few damp sandy situations in the Mallee (e.g. Dimboola district, Lake Coorong); all States.

—Culms *hard and solid*—either biconvex, or with sharp flattened edges and high central rib, or quite flat on one or both faces; panicle various 3

3. Panicle with *loosely arranged* spikelets, elongated (except in *L. lineare*), the lowest branch usually far exceeding its bract 8

—Panicle with *densely aggregated* spikelets, the lowest branch about equal to or shorter than its subtending bract 4

4. Rhizomes growing in mud, quite *vertical*, with erect appressed shoots; culms 3 ft. high or more, biconvex, with *exceedingly sharp* cutting edges, 3-6 mm. wide; glumes all erect and *acuminate*, giving the spikelets a *narrow-subulate* appearance (plant of far eastern Victoria):

551. *L. limicola* N. A. Wakefield in *Vict. Nat.* 70:75, 77 fig. c (1953).*Illust.*: Wakefield (*l.c.*).*Vern.*: Razor Sedge. *Distr.*: Frequent in swamps along streams of far East Gippsland, Vic. (e.g. Reedy Ck. near Cann River, Maramingo Ck. near N.S.W. border); N.S.W., ? Qd (S.E. border districts).

—Rhizomes *not* as above; culms *without* cutting edges or, if ever sharp, then >6 mm. wide; outer glumes obtuse and mucronate or *broadly acute* 5

5. Panicle *elongating*; culms usually <4 mm. wide 7

—Panicle *short*, congested and *widely pyramidal*, subtended by a broadish bract; culms >4 mm. wide; hypogynous scales at least $\frac{1}{2}$ the length of nut (plants usually coastal) 6

6. Culms usually 3 ft. long or more, >6 mm. wide, with prominent *central rib*; hypogynous scales *very broad*, $\pm \frac{1}{2}$ the length of nut:

552. *L. gladiatum* Labill. *Nov. Holl. Plant. Specim. 1*: 15, t. 12 (1805).

Illustr.: Labillardière (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 217 (1943).

Vern.: Coast Sword-sedge. *Distr.*: Frequent on sand-dunes all along the Victorian coast-line from the mouth of Glenelg R. to Gabo Id, sometimes also on calcareous cliffs at or near the sea (e.g. Portland, Port Campbell, Cape Otway, Anglesea, Queenscliff, Frankston, Cape Schanck, Phillip Id, Wilson Prom., Lakes Entrance, Cape Conran, Ram Head, Mallacoota); temperate coasts of all States except Qd.

—Culms <3 ft. long, <6 mm. wide, *plano-convex*; hypogynous scales *long-acuminate*, $\frac{1}{2}$ – $\frac{1}{3}$ the length of nut:

553. *L. concavum* R.Br. *Prodr. Flor. Nov. Holl.* 234 (1810).

Illustr.: Fitch in Hooker f., *Flor. Tasm.* 2: 147 fig. A, col. (1859), as "*L. lateralis*"; Fitch in Clarke, *Ill. Cyperaceæ* t. 86 fig. 6-7 (1909).

Vern.: Sand-hill Sword-sedge (Hill Sword-sedge). *Distr.*: Abundant on near-coastal heaths of southern Victoria from the Lower Glenelg R. to Gabo Id (e.g. Anglesea, Torquay, Queenscliff, Port Phillip Bay, French Id, Waratah Bay, Wilson Prom., Lakes Entrance, Wingan Inlet, Maramingo Ck); Tas., N.S.W., Qd.

7. Culms *flat*; panicle *blackish, interrupted*, with the primary branches very short and spikelets in dense *globoid clusters*; subtending bracts of clusters *long-pointed*, almost pungent:

554. *L. congestum* R.Br. *Prodr. Flor. Nov. Holl.* 234 (1810).

L. globosum sens. Ewart *Flor. Vict.* 246 (1931), *non* Labill. (1805).

Illustr.: Nil.

Vern.: Clustered Sword-sedge. *Distr.*: Scattered on damp sandy flats of western Victoria and rather uncommon (Queenscliff, Upper Glenelg R., Black Range, Poolaigelo near Dergholm, Little Desert); also S.A. where relatively widespread in southern districts.

—Culms often *semi-terete*; panicle *brown or greyish, not interrupted*; spikelets *not* in globoid clusters; subtending bracts *not* very long-pointed:

555. *L. canescens* Boeck. in *Linnæa* 38: 330 (1874).

Illustr.: Wakefield, *Vict. Nat.* 70: 77 fig. B (1953).

Vern.: Hoary Rapier-sedge. *Distr.*: In Victoria apparently confined to a few southern, coastal heaths of the Western District where rare (Portland, between Geelong and Queenscliff), but perhaps overlooked; S.A., N.S.W., ? Qd.

—As for the last, but culms almost *flat*, often with *resinous particles* along edges, and the subtending bracts rather *short and broad* (nut strongly 3-costate):

556. *L. viscidum* R.Br. *Prodr. Flor. Nov. Holl.* 234 (1810).

Illustr.: Black, *Flor. S. Aust.* ed. 2: fig. 218 (1943).

Vern.: Sticky Sword-sedge. *Distr.*: Widespread in far western Victoria, on heaths and Mallee sand-hills where locally frequent (e.g. Grampians, Black Range, Mt. Arapiles, Big and Little Deserts, Dimboola, Wyperfeld Nat. Park, Kulkyn Nat. Forest), also Whipstick Scrub near Bendigo; N.S.W., S.A., W.A.

8. Panicle short (<4 cm. long), scarcely higher than the leaves, with very few (usually 2-5) spikelets; culms and leaves <1 ft. long and up to 2 mm. wide:

557. *L. lineare* R. Br. *Prodr. Flor. Nov. Holl.* 235 (1810).

Illust.: Fitch in Clarke, *Ill. Cyperaceæ* t. 86 fig. 1-3 (1909).

Vern.: Little Sword-sedge (Narrow Sword-sedge). *Distr.*: Restricted in Victoria to swampy heaths in or near the Grampians and to a few alpine stations (Haidinger Range near Mt. Wellington, Nunniong Plateau), but rare; Tas., S.A., N.S.W.

[In the Port Phillip region, the name *L. lineare* has been sometimes erroneously applied to a common narrow-leaved plant, which is at present referred to *L. laterale* var. *angustum* but which may be undescribed—see note under *L. laterale*.]

—Panicle >4 cm. (usually >10 cm.) long, exceeding the leaves; spikelets numerous; culms and leaves >1 ft. long and >2 mm. wide (except in reduced states of *L. viscidum*) 9

9. Culms several feet long (often very tall), 6-10 mm. wide or more, often with a conspicuous central rib, never resinous; spikelet ovoid, 3-5 mm. long; hypogynous scales entire, $\frac{1}{3}$ - $\frac{1}{2}$ the length of the prominently 3-costate nut (robust plant of mountain gullies and forest swamps):

558. *L. elatius* Labill. *Nov. Holl. Plant. Specim. 1*: 15, t. 11 (1805).

Illust.: Labillardière (*l.c.*).

Vern.: Tall Sword-sedge. *Distr.*: Not uncommon in mountain gullies and forest swamps of southern Victoria, from the Grampians to Howe Ranges, tolerating more shade than any other species of *Lepidosperma* (e.g. Hawkesdale, Mt. Macedon, Otways, Kinglake, Dandenongs, Upper Yarra ranges to 3000 ft., Waratah Bay, Wilson Prom., Sunday Id, Monkey Ck, Pipeclay Ck near Orbost, Cann R.); also Tas. where widespread and frequent, ? N.S.W.

[The var. *ensiforme* Rodway *Tasm. Flor.* 246 (1903) differs from the typical form in having leaves and culms quite flat and very broad (to 1"), while the hypogynous scales are very long and slender. It is frequent in Tasmania and extends to wet forest land in south-central Victoria (Dandenong & Otway Ranges, Arthur's Seat). Further investigation may prove this taxon to be a hybrid between *L. elatius* and *L. laterale*, the characters of which it appears to combine.]

—Culms rarely 3 ft. long (except in var. *majus*), up to 6 mm. wide, hardly ribbed and never resinous on margins; spikelet narrow, usually >5 mm. long; hypogynous scales with slender penicillate or barbellate points, almost as long as the nut which is never costate (widespread variable plant):

559. *L. laterale* R. Br. *Prodr. Flor. Nov. Holl.* 234 (1810).

Illust.: Hamlin, *Tuatara* 6: 35 fig. 42 (1956); Fitch in Hooker f., *Flor. Tasm.* 2: t. 146 fig. B, col. (1859), as "*L. concavum*", also t. 147 fig. B, col. (1859), as "*L. angustifolium*"; Fitch in Clarke, *Ill. Cyperaceæ* t. 86 fig. 4-5 (1909).

Vern.: Variable, Sword-sedge (Broad Sword-sedge). *Distr.*: The most widely distributed species of the genus in Victoria where locally frequent on heaths, along streams, on moist or dryish and stony hills (e.g. in such dispersed localities as Lower Glenelg R., Grampians, Little Desert, Mt. Cole, Daylesford, Bendigo, Brisbane Range, Arthur's Seat, Eltham, Graytown, Mt. Feathertop, Upper Murray R., Dandenongs, Wilson Prom., Bairnsdale, Lakes Entrance, Snowy R. gorge, Mt. Kaye), but not in Mallee or on grasslands; all States except W.A., also N.Z.

[The var. *majus* Benth. *Flor. aust.* 7: 394 (1878), type from Port Jackson, has broad very flat culms and a large panicle to 1 ft. long; it closely resembles *L. elatius* var. *ensiforme* (q.v.), and is not uncommon in forest gully country of southern Victoria—from the Glenelg R. eastwards. The var. *angustum* Benth. (*l.c.*) has contrastingly narrow culms (only 2-3 mm. wide) and is also recorded for southern Victoria. To this latter variety has been assigned a common plant of Victorian coastal heaths (Queenscliff, Oakleigh etc.), having culms 2-3 mm. broad and short panicles of 2-3"; but the hypogynous scales are broadish, only about $\frac{1}{4}$ the length of nut and *without* penicillate points—it may represent an undescribed species.]

—Culms up to 2 ft. long and to 4 mm. wide, almost *flat*, often bearing *resinous particles* along the edges; hypogynous scales short and broad, sometimes penicillate; nut strongly *3-costate* (plant chiefly of sandy soil in Mallee);

L. viscidum R. Br. [See No. 556].

10. Axis of panicle *straight* or slightly flexed; spikelets often *numerous* \pm *appressed* to the panicle-branches; glumes *acute* to *acuminate* 12

—Axis of the short panicle *very flexuose*, finally *deflexed*; spikelets rather *few*, narrow and *diverging* widely; glumes *obtuse* or with a mucro 11

11. Culms up to 1 ft. high, 0.5-1 mm. thick; bracts small, *inconspicuous*; spikelets *few* (2-5):

560. *L. tortuosum* F. Muell. *Fragm. Phyt. Aust.* 9: 23 (1875).

Illust.: Nil.

Vern.: Tortuous Rapier-sedge (Twisting Rapier-sedge). *Distr.*: Scattered on a few inland and damp mountain heaths of eastern Victoria where rare (Emerald, Tomahawk Ck near Beenak, subalps at Mt. Wellington); Tas., N.S.W., ? S.A. (a Kangaroo Id record being doubtful).

—Culms >2 ft. high, 1-1.5 mm. thick; bracts *large, broad*, blunt and chaffy; spikelets >5:

561. *L. forsythii* A. A. Hamilton in *Proc. Linn. Soc. N.S.W.* 35: 411 (1910).

Illust.: Nil.

Vern.: Large-flowered Rapier-sedge (Stout Rapier-sedge). *Distr.*: Scattered on wet or swampy heaths of near-coastal, eastern Victoria where not uncommon locally (North Tynong, Garfield and Bunyip in W. Gippsland, Tonghi plains and Reedy Ck near Cann R., Maramingo Ck near Genoa); also N.S.W.

12. Panicle *brown* or *greyish*, *elongated* or with spreading branches; lowest bract *not* rigid, usually much *shorter* than the inflorescence; glumes obtuse or acute, but *never* long-acuminate 14

—Panicle becoming *blackish*, condensed and spike-like; lowest bract *rigid*, almost pungent, *very long*, often as long as inflorescence; all the glumes *acuminate* 13

13. Culm *slightly angular*; panicle *rarely* > 1" long, somewhat *fan-shaped*; spikelets *few*, becoming loose, > 8 mm. long; hypogynous scales *acuminate*, $\frac{1}{3}$ – $\frac{1}{2}$ the length of nut (sandy tracts in far west of State):

562. *L. carphoides* F. Muell. ex Benth. *Flor. aust.* 7: 400 (1878).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 220 (1943); Ewart, *Plant. indig. Vict.* t. 98 opp. 35 (1910); Mueller, *Key Syst. Vict. Plant.* 2: fig. 125 (1886).

Vern.: Black Rapier-sedge. *Distr.*: Restricted in Victoria to damp sandy tracts of the west where widespread and often frequent, but not in the drier Far North-west (Lower Glenelg R., Poolaigelo, Black Range, Grampians, Moyston, sources of Avoca R., Dimboola, Little & Big Deserts where abundant, Wyperfeld Nat. Park, Murrayville district); also S.A., W.A.

—Culm *strongly angled*; panicle *usually* > 1" long; spikelets *numerous*, remaining appressed, < 8 mm. long; hypogynous scales minute, < $\frac{1}{3}$ the length of nut which has an exceptionally thickened apex (swampy near-coastal tracts in east of State):

563. *L. neesii* Kunth *Enum. Plant.* 2: 319 (1837).

Illust.: Nil.

Vern.: Stiff Rapier-sedge. *Distr.*: Occasional on swampy heaths near the coast in eastern Victoria (Mornington Penins. at Bittern, Strzelecki Ranges, Wilson Prom., Marlo, Reedy Ck near Cann R., Thurra R., Maramingo Ck beyond Genoa), with an isolated western occurrence on the Lower Glenelg R.; also N.S.W. (at least as far north as Port Jackson).

14. Leaves *reduced* to basal sheaths, with or without short capillary blades 16

—Leaves normal, the blades well developed and conspicuous 15

15. Leaf-blades *terete* or slightly flattened, with *rounded* edges; panicle branches short and *appressed*; hypogynous scales *ciliate*:

L. canescens Boeck. [See No. 555].

—Leaf-blades *flat*, with *thin hyaline* edges; panicle branches *divergent*, rather slender; hypogynous scales glabrous:

564. *L. semiteres* F. Muell. ex Boeck. in *Linnaea* 38: 327 (1874).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 219 (1943).

Vern.: Wire Rapier-sedge. *Distr.*: Scattered on near-coastal heaths and sandy inland tracts of western Victoria from Lower Glenelg R. to eastern shores of Port Phillip and locally frequent, but absent from the Mallee (e.g. Poolaigelo, Black Range, Grampians, Ararat, Heathcote district, Anglesea, Torquay, Bellarine Penins., Brisbane Range, Arthur's Seat, Frankston); also S.A. where not uncommon in southern districts.

16. Culms 3-5 ft. long, terete or obscurely furrowed; panicle of 1-several, *very slender, dark spikes*, the central manifestly longer; spikelets usually *numerous* (>12 per culm) and closely *appressed* to the axes (plant of East Gippsland):

565. *L. urophorum* N. A. Wakefield in *Vict. Nat.* 70: 76, 77 fig. A (1953).

Illust.: Wakefield (*l.c.*).

Vern.: Tailed Rapier-sedge. *Distr.*: Confined in Victoria to the forests of East Gippsland, often in rocky situations along watercourses (e.g. Nowa Nowa, Wibenduck Ck near Orbost, Bemm & Genoa Rivers); N.S.W., Qd (far S.E.).

—Culms <3 ft. long; panicle branches neither very long, slender and dark *nor* with closely-appressed spikelets 17

17. Culms *entirely terete* and smooth; inflorescence often a *simple spike*, with few (<12) spikelets loosely arranged:

566. *L. filiforme* Labill. *Nov. Holl. Plant. Specim.* 1: 17, t. 15 (1805).

Illust.: Labillardière (*l.c.*).

Vern.: Common Rapier-sedge (Thread Rapier-sedge). *Distr.*: Widely dispersed throughout many parts of Victoria from sea-level to the subalps, but never frequent and absent from Mallee, Murray lands and all grassland tracts (Grampians, Mt. Cole, Curdie's Inlet, Otways, Creswick, Kinglake Nat. Park, Emerald, Mt. Wellington & Haidinger Range); Tas., N.S.W., N.Z.

—Culms each with 2 *sharp angles* or a deep groove (more apparent in upper portion of culm); inflorescence a short *panicle* (rarely reduced to a single spike), with >12 loose spikelets:

L. semiteres F. Muell. ex Boeck. [*See* No. 564].

184. *TRICOSTULARIA* Nees in Lehm. (1846)

567. *T. pauciflora* (F. Muell) Benth. *Flor. aust.* 7: 383 (1878).

Lepidosperma pauciflorum F. Muell. *Fragm. Phyt. Aust.* 9: 23 (1875).

Illust.: Fitch in Clarke, *Ill. Cyperaceæ* t. 87 fig. 3 (1909).

Vern.: Needle Bog-rush. *Distr.*: Confined in Victoria to damp southern (usually near-coastal) heathlands and rarely collected (Nine-mile Ck near Casterton, southern parts of Grampians where locally frequent at Yarram Gap, Mt. Abrupt etc., also Anglesea and Quail Id in Western Port), but probably overlooked on sandy heaths of Gippsland; also N.S.W., S.A. (Mt. Compass).

Diagn.: Tough, shortly rhizomic, tufted perennial 6-12" high; leaves basal, reduced to reddish sheaths with or without short green subulate blades to 15 mm. long; culms wiry, usually curved, slender, \pm terete, deeply striated, 0.3-0.8 mm. wide; inflorescence a very reduced few-flowered terminal panicle 5-25 mm. long; spikelets 1-4, each 4-6 mm. long, ovoid, bright brown, subtended by acuminate glume-like bracts 5-15 mm. long, 2-flowered, only the upper floret fertile; glumes \pm 6, ovate, acuminate, often \pm aristate, subequal, the lower 2-3 always empty; nut obovoid, \pm 2 mm. long, contracted at base, obscurely 3-ribbed, greyish-pubescent (at least near summit); style not thickened at base, deciduous, with 3 filiform branches; hypogynous scales 6, \pm dilated, minute (0.2 mm. long); anthers 3, linear, 1.3 mm. long.

185. GYMNOSCHÆNUS Nees (1841)

568. *G. sphærocephalus* (R. Br.) Hook. f. *Flor. Tasm.* 2: 83 (1858), t. 142, col. (1859).

Chætopora sphærocephala R. Br. *Prodr. Flor. Nov. Holl.* 233 (1810).

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Button-grass (Button Bog-rush). *Distr.*: Scattered on swampy depressions of heaths in southern Victoria from the Lower Glenelg R. to Howe Ranges, usually along watercourses and locally abundant (e.g. Heywood, Grampians, Curdie's R., Upper Beaconsfield, Tonimbuk, Wilson Prom., Tambo R., near Orbost, Cape Conran, Reedy Ck. near Cann R., Maramingo Ck); cool temperate parts of all States except W.A., and frequent over much of Tas.

Diagn.: Shortly and stoutly rhizomic perennial, forming large coarse tussocks 3-6 ft. high; leaves radical, very numerous, 2-4 ft. long, 1-3 mm. wide, tough, flat or channelled, dilating at base into long, brown, open sheaths fringed with pale woolly hairs (to 5 mm. long); culms tense, rigidly erect, to 6 ft. tall, compressed or obscurely 3-angled, 1.5-5 mm. wide, smooth, polished; inflorescence a single, dense, globular head 1-2 cm. wide, with numerous sessile spikelets and 3-5 pale, very broadly ovate or orbicular, mucronate, hair-fringed involucre bracts at base; spikelets 4-6 mm. long, \pm compressed, 2-flowered with only the upper fertile; glumes 6-8, subdistichous, shining, the 4-5 outer ones very broad and obtuse (2-4 mm. long), the inner flowering glumes \pm 5 mm. long and completely enveloping each other; nut obovoid to turbinate, narrow, lustrous, smooth, 3-4 mm. long, crowned by the slender, persistent, \pm pubescent style-base (\pm 2 mm. long); hypogynous bristles 3, capillary, scaberulous, to 2 mm. long; anthers 3, linear, \pm 3 mm. long.

186. CAUSTIS R. Br. (1810)

1. Ultimate branches *extremely flexuose* (usually coiled in almost a complete circle), \pm 0.3 mm. wide; spikelet bisexual, both flowers 3-staminate; body of mature nut (without style-base) 3-4 mm. long:

569. *C. flexuosa* R. Br. *Prodr. Flor. Nov. Holl.* 239 (1810).

Illust.: Pfeiffer, *Repert. Spec. nov. Regn. veg.* 21: t. 21 fig. m-n (1925); Fitch in Clarke, *Ill. Cyperaceæ* t. 100 fig. 6 (1909).

Vern.: Curly-wig (Curly Grass). *Distr.*: Except for isolated occurrences at Lower Glenelg R. and Otways, confined in Victoria to near-coastal heaths of Gippsland and abundant throughout the grass-tree plains, thriving on the poorest sandy soils where it may attain heights of 4-5 ft. (Tambo, Snowy & Bemm Rivers, Mt. Drummer, Howe Range, Mallacoota, Upper Genoa R.); N.S.W., Qd, ? N. Aust.

—Ultimate branches *straight or slightly flexed*, >0.3 mm. wide; stamens 4-6 2

2. Branchlets *almost straight*, 1-1.5 mm. wide; spikelet *bisexual*, at least the fertile flower 5-staminate (male floret often with only 2 or 3 stamens); body of nut (without style-base) \pm 6 mm. long (plants often robust, to 5 ft. high):

570. *C. pentandra* R. Br. *Prodr. Flor. Nov. Holl.* 240 (1810).

Illust.: Pfeiffer, *Repert. Spec. nov. Regn. veg.* 21: t. 21 fig. o (1925); Fitch in Clarke, *Ill. Cyperaceæ* t. 100 fig. 4-5 (1909).

Vern.: Thick Twist-rush. *Distr.*: Scattered on heaths and in light, sandy forests of western and southern Victoria, from the Lower Glenelg R. to Mallacoota, being locally common (Casterton, Black Range, Grampians, Little Desert, Lerderderg Gorge on Tertiary cappings, Tonimbuk, Strzelecki Ranges, Wilson Prom., Merriman's Ck, Munro, Sperm Whale Head, between Cann R. and Tamboon Inlet, Wingan Inlet); temperate parts of all States.

—Branchlets *gently flexed*, ± 0.5 mm. wide; spikelet *unisexual* by abortion, the stamens in male spikelets (and filaments or staminodia in the females) 4; body of nut ± 4 mm. long (plants usually 1-2 ft. high):

571. *C. restiacea* F. Muell. ex Benth. *Flor. aust.* 7: 421 (1878).

Illust.: Nil.

Vern.: Slender Twist-rush. *Distr.*: Restricted in Victoria to the Grampians, where occasional on sandy ground (e.g. Mts. William & Abrupt), and northern Otways; also N.S.W. (at least as far north as Mittagong district).

187. *OREOBOLUS* R. Br. (1810)

Leaf-blades *strongly distichous* (almost fan-like), \pm *acutely pointed*, 1-2" long (rarely less), up to 1 mm. wide, often slightly *involute*, with only the midrib (and sometimes 2 lateral veins) prominent beneath; leaf-sheaths \pm distinctly *auriculate* at summit; subtending bract of spikelet 6-12 mm. long; nut *obpyriform*, glabrous:

572. *O. distichus* F. Muell. in *Trans. phil. Soc. Vict.* 1: 109 (1855).

O. pumilio sens. Ewart *Flor. Vict.* 234 (1931) *pro parte, non* R. Br. (1810) sens. strict.

Illust.: Nil.

Vern.: Fan Tuft-rush. *Distr.*: Frequent in bogs almost throughout the Victorian alps above 4500 ft., extending into alpine herbfield (e.g. Lake Mountain & Baw Baws, Mts. Buller, Stirling, Cobbler, Buffalo & Wellington, Dargo & Bogong High Plains, Cobboras); also Tas., N.S.W., A.C.T.

Leaf-blades *not* noticeably distichous, \pm *obtuse*, $< 1"$ long, 1-1.5 mm. wide, *flat*, with about 5 veins equally prominent as ribs on the under-surface; leaf-sheaths *without auricles*; subtending bract of spikelet ± 5 mm. long; nut *ellipsoid*, pubescent at apex:

573. *O. pumilio* R. Br. *Prodr. Flor. Nov. Holl.* 236 (1810).

Illust.: Fitch in Clarke, *Ill. Cyperaceæ* t. 102 fig. 1-5 (1909).

Vern.: Alpine Tuft-rush. *Distr.*: In Victoria apparently restricted to the Bogong High Plains above 5400 ft. (Spion Kop, heads of Rocky Valley and Middle Ck), where occasional in bogs and alpine herbfield; Tas., N.S.W. (Kosciusko Plateau), N.Z., N.G. (Lake Habbema at $\pm 10,500$ ft. alt.).

[Although, by definition, *Oreobolus* is supposed to have solitary spikelets, Victorian populations of both *O. distichus* and *O. pumilio* not infrequently have 2-4 spikelets per scape. The former species is very similar to, but larger than, *O. pectinatus* Hook. f. of New Zealand.]

Tribe HYPOLYTREÆ

188. CHORIZANDRA R. Br. (1810)

Culm bright *green, soft*, strongly and *regularly septate* (hollow between septa), 2-4 ft. long, 2-6 mm. wide; spikelets \pm 5 mm. long; nut \pm globular, 3-4 mm. wide at maturity, with 8 acute vertical ribs connected irregularly by a *few transverse wrinkles* (plant widespread through southern Victoria):

574. *C. cymbaria* R. Br. *Prodr. Flor. Nov. Holl.* 221 (1810).

Illust.: Pfeiffer, *Bot. Arch.* 12: 471 (1925); Brown in Clarke, *Ill. Cyperaceæ* t. 119 fig. 16-23 (1909).

Vern.: Heron Bristle-rush. *Distr.*: Occasional on swampy ground of near-coastal heaths in southern Victoria, from Lower Glenelg R. to Cape Howe, but not common (Hawkesdale, Tonimbuk, Mornington Junction, Tarwin R., Tonghi plains, Reedy Ck near Cann R., Mallacoota); all States except S.A., also N. Cal.

Culm usually *greyish, wiry*, irregularly and only very *obscurely septate*, multi-tubular, up to 18" long (often <1 ft.), 1-1.5 mm. wide; spikelets 3.5 mm. long; nut \pm globular, 2.5 mm. long and wide, \pm *muricate* between the longitudinal ribs (plant of western Victoria):

575. *C. enodis* Nees in Lehm. *Plant. Preiss.* 2: 73 (1846).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 229 (1943); Pfeiffer, *Bot. Arch.* 12: 471 (1925); Brown in Clarke, *Ill. Cyperaceæ* t. 119 fig. 8-11 (1909).

Vern.: Black Bristle-rush. *Distr.*: Widespread and locally frequent in western Victoria, favouring damp sandy flats along streams, in heaths or between Mallee sand-hills, but not extending into the Far North-west (e.g. Near Lara, Queenscliff, sources of Avoca R., Hopkins R., Grampians, Black Range, Upper & Lower Glenelg R., Big & Little Deserts); all States except Qd, but rare in Tas. (near Georgetown).

Tribe CARICEÆ

189. UNCINIA Pers. (1807)

1. Culms <6" high; leaf-blades <1 mm. wide (usually \pm capillary); spikelet <1.5 cm. long; body of utricle *not* exceeding the subtending glume, almost nerveless, <1 mm. wide; male flowers *2-staminate* (frequent shade-tolerant plant of forest fern gullies):

576. *U. tenella* R. Br. *Prodr. Flor. Nov. Holl.* 241 (1810).

Illust.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 152 fig. A, col. (1859).

Vern.: Delicate Hook-sedge. *Distr.*: Highly shade-tolerant, and restricted in Victoria to damp mountain gullies of central and eastern districts where not infrequent along forest streams, on decaying logs or even on tree-fern trunks (e.g. Otways, Mt. Macedon, Dandenongs, Upper Yarra & Goulburn R. watersheds, Baw Baws, Strzelecki Ranges, Wilson Prom., Arte R., Mt. Ellery, Goonmirk Range, Mt. Drummer); also Tas., N.S.W.

- Culms >6" high; leaf-blades 1-3 mm. wide; spikelet 2-5 cm. long; body of utricle *equalling or exceeding* the glume; male flowers *3-staminate*

2. Spikelet 2-3 cm. long; body of mature utricle about *as long as* glume, 1.5-1.7 mm. broad, with few (2-4) *inconspicuous nerves* (alpine plant):

577. *U. flaccida* S. T. Blake in *Proc. roy. Soc. Qd* 51: 49 (1940).

U. compacta sens. Ewart *Flor. Vict.* 226 (1931), *non* R. Br. (1810).

Illust.: Nil.

Vern.: Mountain Hook-sedge. *Distr.*: Scattered on alpine herbfield (usually above 4800 ft.) almost throughout the eastern highlands of Victoria, but rather uncommon (Mt. Federation near Lake Mountain, Baw Baws, Mt. Buller, Mt. Stirling, Mt. Cobbler, Mt. Buffalo, Barry Mts., Mt. Hotham, Bogong High Plains); also N.S.W., in similar terrain.

[The related Tasmanian mountain species *U. compacta* R. Br., with which *U. flaccida* has been confused, differs in its much *shorter stiffer leaves*, denser spikelet and narrower utricles.]

—Spikelet 3-5 cm. long; body of mature utricle *far exceeding* the glume, \pm 1 mm. broad, striated with *numerous rather distinct nerves* (very rare plant of highland streams):

578. *U. riparia* R. Br. *Prodr. Flor. Nov. Holl.* 241 (1810).

Illust.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 152 fig. B, col. (1859).

Vern.: River Hook-sedge. *Distr.*: Extremely rare in Victoria, if present at all, the only two confirmatory collections being of somewhat doubtful provenance—viz. "Upper Hume R." (Jan. 1874), "Victorian Alps" (Jan. 1900); also N.S.W. (southern tablelands), Tas. ("common in shady woods"—*teste* Rodway, 1903).

[In *Dominion Museum Bulletin* 19: 1-106 (Feb. 1959), B. G. Hamlin provides a detailed monograph on the 31 species of *Uncinia* known to occur in New Zealand where there is a high degree of endemism. He excludes the Australian *U. tenella*, *U. compacta* and *U. riparia* which, although recorded for New Zealand by Cheeseman and other authorities, are replaced there by related but amply distinguishable species.]

190. CAREX L. (1753)

1. Spikes *several to many* (if solitary in some depauperate states of *C. inversa*, *C. hebes*, etc., then the utricles with setulose margins) 4

—Spike *solitary and terminal*, up to 10 mm. long, male flowers above and females below; utricles with smooth margins (all alpine species—Subgenus PRIMOCAREX) 2

2. Staminate part of spike *as long as* (or longer than) pistillate portion; female glumes minute, *very obtuse* and almost as broad as long (stigmas 3):

579. *C. capillacea* Boott *Ill. Gen. Carex* 1: 44, t. 110 (1858).

C. rara sens. Ewart *Flor. Vict.* 228 (1931), *non* Boott (1846).

Illust.: Boott (*l.c.*).

Vern.: Sedge. *Distr.*: Very localized and rather rare in Victoria where known from only two localities in the far-eastern alps and subalps, on swampy ground (viz. Cobungra at 4000 ft., Cobboras and nearby "Playground Top" at 5-6000 ft.); N.S.W. (alps), N.Z., N.G. (Mt. Wilhelmina at 11,000 ft.), Celebes, Philippines, Japan, China, India.

—Staminate part of spike *shorter* than pistillate and inconspicuous; female glumes *acutish* and longer than broad 3

3. Lowest female glume *bract-like*, *exceeding the inflorescence*; spike \pm 5 mm. long, the pistillate part 3-6-flowered; utricles long-beaked; stigmas 3:

580. *C. archeri* Boott in Hook. f. *Flor. Tasm.* 2: 98 (1858), t. 150 fig. A, col. (1859).

C. acicularis sens. Ewart *Flor. Vict.* 228 (1931), *non* Boott (1853).

Illust.: Fitch in Hooker f. (*l.c.*); Boott, *Ill. Gen. Carex* 4: t. 508 fig. 3 (1867).

Vern.: Sedge. *Distr.*: Scattered and uncommon in the more eastern alps of Victoria above 4500 ft., usually on wet ground near the sources of streams and sometimes sheltered by rocks (Mts. Hotham, Feathertop, Fainter & Bogong, Tawonga Hut near Niggerhead peak, near Cravensville); also Tas.

[*C. acicularis* Boott of New Zealand is closely related; it differs in the culms which far exceed leaves, comparatively shorter female glumes, and quite smooth margins to utricles].

—Lowest female glume *normal*; spike about 10 mm. long, the pistillate part many-flowered; stigmas 2:

581. *C. cephalotes* F. Muell. in *Trans. phil. Soc. Vict.* 1: 110 (1855).

C. pyrenaica sens. Ewart *Flor. Vict.* 228 (1931), *non* Wahlenb. (1803).

Illust.: Boott, *Ill. Gen. Carex* 4: t. 477 (1867).

Vern.: Sedge. *Distr.*: Very localized and rare in Victoria where known by only two alpine collections, viz. Mt. Hotham (Jan. 1900) and Mt. Bogong (Jan. 1923), both at or above 6000 ft. alt.; also N.S.W. (in alpine bog, herbfield and grass-land of the Kosciusko region), N.Z.

4. Spikes usually *elongated and stalked*, the lowermost sometimes remote and drooping; terminal spike *wholly male*, or rarely with a few female flowers at apex; stigmas 3 [except in *C. gaudichaudiana* and *C. polyantha* which have elongated spikes and blackish glumes] (Subgenus EUCAREX) 15

—Spikes comparatively *short and broad*, *sessile*, erect, frequently congested on the culm; terminal spike [except in *C. disticha*], and often the others, always *partly male* and partly female; stigmas 2 (Subgenus VIGNEA) 5

5. Spikes <10 , usually *almost capitate*, rarely becoming remote on an elongated inflorescence (plants slender, usually <1 ft. high) 7

—Spikes *numerous* (20 or more), densely clustered on a *long narrow* panicle (plants robust, usually >1 ft. high) 6

6. Culms *triquetrous, solid*; leaves > 4 mm. wide; female glumes with only *narrow membranous margins*:

582. *C. appressa* R. Br. *Prodr. Flor. Nov. Holl.* 242 (1810).

Illust.: Kükenthal, *Pflanzenreich* IV 20 (Heft 38): 178 fig. 29 E-J (1909); Boott, *Ill. Gen. Carex* 1: tt. 119-120 (1858).

Vern.: Tall Sedge. *Distr.*: Abundant in freshwater swamps, on stream-banks and damp places generally almost throughout Victoria, from sea-level to the alps, but not in the Far North-west (e.g. in localities as widely dispersed as Lower Glenelg R., Grampians, St. Arnaud, Bendigo, Camperdown, Otways, Melbourne, Graytown, Chiltern, Upper Murray R., Suggan Buggan, Combienbar, Bogong & Dargo High Plains, Mts. Buffalo, Buller & Cobbler, Wilson Prom.); all States, N.Z., N. Cal., N.G.

[The forma *minor* Kükenth. in *Pflanzenreich IV* 20 (Heft 38): 179 (1909) has culms less than 1 ft. high, with short spike-like panicle less than 2" long; it occurs in the Victorian highlands, extending to New South Wales and Tasmania where frequent in the Sheffield-Cradle Mtn. area.]

—Culms *terete, hollow*; leaves <4 mm. wide; female glumes with conspicuous, *broad, pale, membranous margins*:

583. *C. tereticaulis* F. Muell. *Fragm. Phyt. Aust.* 8: 256 (1874).

Illust.: Kükenthal, *Pflanzenreich IV* 20 (Heft 38): 178 fig. 29 A-D (1909).

Vern.: Sedge. *Distr.*: Widely distributed on damp ground throughout lowland Victoria, except in the Mallee and East Gippsland, but not common (e.g. Upper Glenelg R., Grampians, Dimboola, Ararat, Hawkesdale, Portland, near Geelong, Plenty R., Creswick, Bealiba, Seymour, Nathalia, Rutherglen, Rosedale); all States except Qd (?).

7. Bract of lowermost spike *not foliaceous* and *never* longer than inflorescence 11

—Bract of lowermost spike *foliaceous* and far *exceeding* the whole inflorescence 8

8. Glumes *dull, pallid or greenish*, without contrasting white margins; utricles \pm costate and often distinctly trabeculate between the ribs 10

—Glumes *shining, chestnut-brown*, with whitish hyaline margins; utricles faintly nerved (alpine or subalpine) 9

9. Culms >10" high; leaves <1 mm. wide; utricles 3 mm. long (a very *tenuous, filamentous plant*):

584. *C. raleighii* E. Nelmes in *Kew Bull.* 1939: 310 (1939).

Illust.: Nil.

Vern.: Sedge. *Distr.*: Localized and rare in Victoria where known by only two subalpine collections, viz. the type from near Cobungra at about 4000 ft. (Jan. 1938), and margins of sphagnum bog on the Delegate River between Bonang and Bendoc, at about 3000 ft. (Jan. 1948), but perhaps overlooked because of its extremely slender nature; also Tas. (The Steppes, at 2900 ft., Jan. 1948).

—Culms <10" high; leaves 1-2 mm. wide; utricles 3.5-4 mm. long:

585. *C. hebes* E. Nelmes in *Kew Bull.* 1939: 310 (1939).

Illust.: Nil.

Vern.: Sedge. *Distr.*: Widespread and locally frequent in the Victorian alps, inhabiting grassland, herbfield, bog and fen formations (Lake Mountain, Mts. Skene, Buller, Stirling, St. Bernard & Hotham, Bogong & Dargo High

Plains), with isolated lowland occurrences at Sandon near Elmore and Gorā West near Portland (where probably introduced with stock from the highlands); also N.S.W. (Kosciusko region).

10. Culms far exceeding 1", always more than half as long as the leaves; spikes normally and obviously several; utricles with several prominent ribs:

586. *C. inversa* R. Br. *Prodr. Flor. Nov. Holl.* 242 (1810).

Illust.: Kükenthal, *Pflanzenreich IV* 20 (Heft 38): 188 fig. 31 A-C (1909); Bacchus & Gilbert, *Annu. Rep. Dep. Agric. Vict.* 2: t. 5 (1874); Boott, *Ill. Gen. Carex* 4: t. 488 fig. 2-3 (1867).

Vern.: Sedge. *Distr.*: Widespread throughout Victoria, except in the Mallee and highest alps, and abundant in damp places generally from the Lower Glenelg R. to Bendoc (e.g. Heywood, Grampians, Dimboola, Dunolly, Ballarat, Curdie's R., Brisbane Range, Port Phillip, San Remo, Dandenongs, Goulburn Valley, Ovens R., Mitta Mitta, Mt. St. Bernard, Upper Murray R., Tubbut, Maroka R. valley); all States, N.Z.

[The species sometimes becomes a weed in suburban lawns. Populations are highly variable in stature, a common robust condition being designated as forma major Boott, *Ill. Gen. Carex* 4: 151, tt. 486-487 (1867)—with leaves 3 mm. broad.]

—Culms <1" tall and not more than half as long as leaves; spikes often appearing solitary; utricles (as far as seen) only 2- to 3-ribbed:

587. *C. paupera* E. Nelmes in *Proc. Linn. Soc. Lond.* 155: 282 (1944).

Illust.: Nil.

Vern.: Sedge. *Distr.*: Apparently endemic in Victoria, where very rare and known only from the type (Mt. Hotham at about 6000 ft., Feb. 1940). [Although at present appearing distinctive, it may eventually prove to be only an extremely reduced state of *C. inversa*.]

11. Inflorescence slender, 2" long or more, \pm interrupted so that at least the lower spikes are remote from each other (at least the upper spikes having male flowers below; utricle \pm 5 mm.):

588. **C. divulsa* Stokes in With. *Bot. Arr. Veg. Gt Brit.* ed. 2, 2: 1035 (1787).

Illust.: Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 91 G (1940); Strudwick, *Further Ill. Brit. Plant.* fig. 407 (1930); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2920 c, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3825 (1906); Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 218 (1908); Reichenbach, *Icon. Flor. germ.* 8: t. 220 fig. 570, col. (1846).

Vern.: Sedge. *Distr.*: Indigenous to Europe, W. Asia, N. Africa, Canary Is. and Azores; introduced into ? N. Amer., N.Z. (Auckland district) and Victoria where noted as an occasional alien on damp ground at Bacchus Marsh, Melbourne and Yackandandah.

—Inflorescence almost capitate and much less than 2" or, if longer (rarely), then the spikes all close together

12. Lower bracts entirely glumaceous; female glumes pallid or greenish, 2 mm. long or less

- Lower bracts *longer than glumes* and often setiferous or, if otherwise, then the glumes bright brown; female glumes 3-4 mm. long 13
13. Terminal spike *male* at the top; utricle very flattened, with narrow *serrulate margins*, lacking ribs or veins (spikes greenish or pale brown):
589. *C. chlorantha* R. Br. *Prodr. Flor. Nov. Holl.* 242 (1810).
Illustr.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 150 fig. B col. (1959); Boott, *Ill. Gen. Carex* 4: t. 580 B (1867).
Vern.: Sedge. *Distr.*: Scattered in cool wet places through south-western and eastern Victoria excepting the alps, sometimes riparian, but rather uncommon (Glenelg R., near Ballarat, Ballan, river-flats near Yarra Glen, Upper Jamieson R., Upper Murray R., Snowy R. near Orbost, Toongabbie, Latrobe R.); Tas., N.S.W. (ascending to subalpine woodland).
- Terminal spike *male* at the top; utricle with almost parallel *smooth margins*, neither winged nor serrulate, many-veined (spikes bright brown):
590. **C. divisa* Huds. *Flor. angl.* 348 (1762).
Illustr.: Gleason, *New Britton & Brown Ill. Flor. N.E. United States & Canada* 306 (1952); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1126 (1931); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2907, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3812 (1906); Kükenthal, *Pflanzenreich IV* 20 (Heft 38): 116 fig. 22 G-H (1909); Reichenbach, *Icon. Flor. germ.* 8: t. 205 fig. 545, col. (1846).
Vern.: Divided Sedge. *Distr.*: Indigenous to Europe, Africa, W. & Cent. Asia; introduced into N.Z., Tas. (Bellerive & King Id) and Victoria where known by three collections from Ballarat (Nov. 1905), Creswick (Sept. 1943) and Yarra Glen (Dec. 1939), but of doubtful persistence in the State.
- Terminal spike *entirely female*; utricle narrowly *winged and serrulate* above, many-ribbed (spikes bright brown):
591. **C. disticha* Huds. *Flor. angl.* 347 (1762).
Illustr.: Strudwick, *Further Ill. Brit. Plant.* fig. 406 (1930); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2909, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3814 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 45 fig. 6, col. (1908); Reichenbach, *Icon. Flor. germ.* 8: t. 210 fig. 552, col. (1846), as "*C. intermedia*".
Vern.: Sedge. *Distr.*: Indigenous to Europe, Siberia and W. China; introduced into Victoria where at present known only by a single collection from Marlo at the mouth of Snowy R. (Nov. 1943)—on damp flats amongst luxuriant grass, and doubtfully naturalized.
14. Utricles *reflexed* at maturity; tapering beak about *as long as* body of utricle, broadly *margined*, with teeth at least 0.25 mm. long:
592. *C. echinata* Murr. *Prodr. Stirp. götting.* 76 (1770).
C. stellulata Gooden. in *Trans. Linn. Soc. Lond.* 2: 144 (1794).
Illustr.: Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1118 (1931); Kükenthal, *Pflanzenreich IV* 20 (Heft 38): 229 fig. 37 C-D (1909), as "*C. stellulata*"; Pfenninger in Hegi, *Ill.*

Flor. Mittel-Eur. 2: t. 47 fig. 3, col. (1908), as "*C. stellulata*"; Coste, *Flor. Franc.* 3: fig. 3827 (1906); Reichenbach, *Icon. Flor. germ.* 8: t. 114 fig. 560, col. (1846), as "*C. stellulata*".

Vern.: Star Sedge. *Distr.*: Localized and rather rare in Victoria where apparently confined to a few boggy places in the eastern alps (Cobungra, Mt. Fainter, Tawonga Hut near Niggerhead peak, creek heads north of Basalt Hill on Bogong High Plains); also N.S.W. (Kosciusko region in alpine herbfield and subalpine woodland), N.Z., Japan, China, Siberia, W. Asia, Europe (except southern), Azores, N. Amer.

[Victorian (and New South Wales) populations are consistently more *congested* and *smaller* in all their parts than the typical European form of *C. echinata*; they probably merit recognition as a distinct variety.]

—Utricles *slightly spreading* at maturity, but never reflexed; tapering beak much *shorter than* the body, *not* marginate, with minute teeth to 0.1 mm.:

593. *C. curta* Gooden. in *Trans. Linn. Soc. Lond.* 2: 145 (1794).

C. canescens sens. Ewart *Flor. Vict.* 229 (1931), *non* L. (1753).

Illust.: Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1119 (1931); Eaton in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 754 (1940); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2921, col. (1930–31); Coste, *Flor. Franc.* 3: fig. 3828 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 47 fig. 4, col. (1908); Reichenbach, *Icon. Flor. germ.* 8: t. 206 fig. 546, col. (1846)—all as "*C. canescens*".

Vern.: Sedge. *Distr.*: Confined in Victoria to the alps above 4500 ft., but locally frequent in bog, fen and even herbfield formations (Baw Baws and Bogong High Plains where widespread); N.S.W. (Kosciusko region), ? Tas., N.G. (Lake Habbema at 10,500 ft.), Japan, temperate Asia, Eur. (except southern), N. & S. Amer.

15. Stigmas 3; glumes *not* conspicuously dark or, if blackish, then the utricles *strongly beaked* and with *prominent* diverging teeth 17

—Stigmas 2; glumes *almost black* (except for the pale midrib); utricles *very shortly* beaked, with *minute* teeth 16

16. Glumes of terminal male spike *broadly acute or obtusish*; other spikes up to 2" long; utricles 3–4 mm. long, narrowly ovate, *acute*, distinctly 4- to 6-nerved (leaves 4 mm. broad or less):

594. *C. gaudichaudiana* Kunth. *Enum. Plant.* 2: 417 (1837).

Illust.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 151 fig. A, col. (1859); Boott, *Ill. Gen. Carex* 4: t. 567 (1867), as "*C. vulgaris* var. *gaudichaudiana*".

Vern.: Sedge. *Distr.*: Widespread and frequent in wet open places throughout Victoria, excepting the Mallee, ascending to alpine bogs and fens (e.g. in such dispersed localities as Lower Glenelg R., Grampians, Wail, Murtoa, Avoca, Creswick, Mt. Hope, Brisbane Range, Plenty R., Yarrowonga, Mt. Buffalo, Bogong & Dargo High Plains, Benambra, Delegate R., Genoa R., Bruthen, Wilson Prom., Baw Baws); all States except W.A., N.Z., ? Japan & China.

—Glumes of terminal male spike (or spikes) *narrowly acute*; other spikes usually >2" long (sometimes to 6"); utricles \pm 2.5 mm. long, obovate *obtuse*, obscurely nerved or nerveless (leaves >4 mm. broad):

595. *C. polyantha* F. Muell. in *Trans. phil. Soc. Vict.* 1: 110 (1855).

Illust.: Boott, *Ill. Gen. Carex* 4: t. 579 (1867), as "*C. cunninghamii*".

Vern.: Sedge. *Distr.*: Occasional beside water and in marshy places throughout the cooler parts of Victoria, but neither in the Mallee nor higher alps and apparently absent from far western districts (Lerderderg & Werribee Gorges, Lancefield, Dandenongs, Greta, Whitfield, Nathalia, Ovens R., Buffalo ranges, Mitta Mitta, Big R. between Mts. Bogong & Nelson, Mt. Hotham-Feathertop area, Shelley, Genoa R., Upper Cann R., Bairnsdale); also N.S.W. Qd.

17. Spikes *solitary* at nodes, sessile to shortly pedunculate; upper part of utricle with *smooth* margins (except in some forms of *C. blakei*) 19
—Spikes in *fascicles* of 1-5 at nodes of culm, the female often on long slender peduncles; upper part of utricle *conspicuously setulose* on the margins 18

18. Spikes all on *very long peduncles*, rather *loose-flowered*, slender, 3-5 mm. thick; female glumes <2.5 mm. broad, with *narrow* hyaline margins:

596. *C. longibrachiata* Boeck. in *Linnæa* 41: 282 (1877).

C. longifolia R. Br. *Prodr. Flor. Nov. Holl.* 242 (1810), *non* Host (1809).

Illust.: Kükenthal, *Pflanzenreich* IV 20 (Heft 38): 651 fig. 112 (1909); Boott, *Ill. Gen. Carex* 3: tt. 331-332 (1862)—both as "*C. longifolia*".

Vern.: Bergalia Tussock (Drooping Sedge). *Distr.*: Scattered but locally frequent in eastern Victoria on marshy ground beside watercourses (Cobungra, Bairnsdale, Tambo and Cann Rivers), with apparently an isolated western occurrence on the Lower Glenelg R.; also N.S.W. where an encroaching weed on pastures of the south coast, and reported as introduced into N.Z. (around Auckland).

—Spikes (at least the upper) often on *short peduncles*, always *dense-flowered*, 5-8 mm. thick; female glumes usually >2.5 mm. broad, usually quite chaffy, with *very wide* whitish-hyaline margins (upper 1-4 spikes predominantly male):

597. *C. iynx* E. Nelmes in *Proc. Linn. Soc. Lond.* 155: 279 (1944).

Illust.: Nil.

Vern.: Sedge. *Distr.*: Widespread and locally frequent on damp ground in cooler parts of western Victoria (Lancefield, Ballan, Ballarat, Lake Corangamite, Gorae West & Heywood near Portland, Dartmoor) with an isolated eastern occurrence on Limestone Ck and the nearby Cobboras; also Tas., ? S.A.

[The species is very close to *C. longibrachiata* from which it was segregated and which it seems to replace in western districts of Victoria, excepting the Mallee.]

19. Leaves not septate-nodulose, rarely as broad as 6 mm. 21

—Leaves septate-nodulose, 5-10 mm. broad 20

20. Inflorescence *drooping*, all the spikes *manifestly pedunculate*; glumes long-acuminate; utricle lustrous, *strongly ribbed*, with *slender* teeth \pm 1 mm. long:

598. *C. fascicularis* Soland. ex Boott in Hook. f. *Flor. N.-Z.* 1: 283 (1853).

C. pseudo-cyperus sens. Ewart *Flor. Vict.* 232 (1931), non L. (1753).

Illust.: Hamlin, *Trans. roy. Soc. N.Z.* 84: 685 fig. j-o (1957); Black, *Flor. S. Aust.* ed. 2: fig. 229 a (1943); Ewart, *Flor. Vict.* fig. 133, 134 (1931), as "*C. pseudo-cyperus*"; Meredith, *Bush Friends Tasm.* last ser. t. 1, col. (1891); Boott, *Ill. Gen. Carex* 1: tt. 139-140 (1858).

Vern.: Tassel Sedge (Galingale). *Distr.*: Widespread and not uncommon throughout the cooler parts of Victoria, along open watercourses and in swampy tracts, but neither in the Mallee nor alps (e.g. Lower Glenelg R., Portland, Grampians, Pyrenees, Creswick, Stony Rises near Camperdown, Gellibrand R., Mandurang Forest, Plenty R., Dandenongs, Powelltown, Euroa, Ovens R., Tawonga, Ruffy, Biggara on Upper Murray R., Suggan Buggan, Bonang, Combienbar, Genoa R., Cann R., Orbost, Wilson Prom., Phillip Id); all States, N.Z., N.G., Java.

—Inflorescence *erect*; some upper spikes *subsessile*; glumes acute to shortly acuminate; utricle rather dull, *obscurely ribbed*, with *short teeth* (<0.5 mm. long):

599. *C. alsophila* F. Muell. *Fragm. Phyt. Aust.* 8: 257 (1874).

Illust.: Nil.

Vern.: Forest Sedge. (Broad Sedge). *Distr.*: Apparently endemic in Victoria where restricted to stream-banks and wet flats in mountain-forests of the Acheron, Yarra, Latrobe and Bunyip R. watersheds, ascending to 4000 ft. in the vicinity of Lake Mountain and on the Baw Baws, but locally rather frequent (Beenak, Powelltown, Watts R., Mt. Juliet, Mt. Arnold, Noojee district, Upper Tarago R.).

[*C. conspicua* Boott ex C. B. Clarke in *Kew Bull.* Add. ser. 8: 82 (1908) was separated as a distinct species from part of the type suite (that from Baw Baws and "Tarwan" River) of F. Mueller's *C. alsophila*. Although retained at the species level by E. Nelmes, 1944, *C. conspicua* is based upon quite inconstant details—the disposition of male flowers in the spikelet—and is here considered synonymous with *C. alsophila*.]

21. Inflorescence conspicuous, *almost as long as* leaves or longer, or, if much shorter, then the leaves circinnate and plants never alpine; flowers *usually dense* 23

—Inflorescence *much shorter than* leaves, and often quite hidden; flowers *rather loose* in spike (commonly alpine, with leaves straight at their apices) 22

22. Utricle *glabrous, long-tapering*, \pm 5 mm. long, *indistinctly nerved*; apical teeth *conspicuous* (leaves bluish-green):

600. *C. jackiana* Boott in *Proc. Linn. Soc. Lond.* 1: 260 (1845).

Illust.: Koorders, *Exkursionsflor. Java* 4^a: 114 (1922); Boott, *Ill. Gen. Carex* 1: t. 25 (1858).

Vern.: Sedge. *Distr.*: Confined in Victoria to bogs and stream-edges on the higher alps where locally not uncommon, forming densely compacted, often carpet-like masses (Baw Baws, Mt. Buller, Mt. Stirling, Bogong High Plains); doubtless also in N.S.W. but not yet recorded, ? N.G., Java, Sumatra, Malaya, Ceylon, India.

[Victorian material has *more congested* spikes on a much *shorter culm* than in the typical Javanese and Indian form of the species.]

—Utricle *often pubescent*, broadly fusiform with *short beak*, ± 3 mm. long, *strongly nerved*; teeth *absent or quite minute* (leaves bright green):

601. *C. breviculmis* R. Br. *Prodr. Flor. Nov. Holl.* 242 (1810).

Illust.: Fitch in Hooker f., *Flor. N.-Z. 1*: t. 63 fig. A (1853).

Vern.: Sedge. *Distr.*: Widespread throughout Victoria, except in the Mallee, and occasional on open dampish ground from sea-level to alpine grassland, heath and herbfield, but doubtless often overlooked on account of its low grass-like habit (e.g. Lower Glenelg R., Black Range, Grampians, Dimboola, Creswick, Hawkesdale, Torquay, Mt. Eliza, Melbourne, Dandenongs, Lake Mountain, Baw Baws, Mt. Buffalo, Upper Murray R., Omeo, Bogong & Dargo High Plains, Cobboras, Suggan Buggan, Combienbar, Cann R., Upper Genoa R., Mallacoota, Howe Range); all States, except W.A., Lord Howe Id, N.G., Celebes.

23. Terminal spike *male and female*; utricles *hidden*, *shorter than* the castaneous acuminate glumes, pale, beakless, ± 3 mm. long (spikes all sessile):

602. **C. canescens* L. *Spec. Plant.* 2: 974 (1753).

C. buxbaumii Wahlenb. in *K. svenska Vetensk. Akad. Handl.* 1803: 163 (1803).

Illust.: Ewart, *Flor. Vict.* fig. 132 (1931); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 116 (1957); Eaton in Abrams, *Ill. Flor. Pacific States 1*, ed. 2: fig. 800 (1940); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2933, col. (1930-31); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 48 fig. 2, col. (1908); Boott, *Ill. Gen. Carex* 4: tt. 438-439 (1867); Reichenbach, *Icon. Flor. germ.* 8: t. 235 fig. 589, col. (1846)—all as "*C. buxbaumii*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1132 (1931), as "*C. polygama*".

Vern.: Sedge. *Distr.*: Indigenous to Europe (where localized), Algeria, temperate Asia and N. America; introduced into Victoria at an early period and doubtfully still present, the only voucher collection being from "snowy plains" between the Cobungra R. and Mts. Loch-Feathertop region (Dec. 1854).

—Terminal spike *wholly male*; utricles *conspicuous*, *as long as* or longer than glumes 24

24. Utricles ± 3 mm. long, neither corky *nor* with impressed nerves, or, if >4 mm., then the teeth *minute* and glumes always pale 26

—Utricles usually >4 mm. long, stout, *corky*, costate or sometimes with *impressed nerves*; teeth *conspicuous* (extensively rhizomic, sand-loving plants, often with darkly-pigmented glumes) 25

25. Culms *mostly hidden* among the leaf-sheaths (leaves usually circinnate at apex); male spikes 1-4, the females usually *close beneath*; utricles 5.5-7 mm. long:

603. *C. pumila* Thunb. *Flor. japon.* 39 (1794).

Illust.: Kükenthal, *Pflanzenreich* IV 20 (Heft 38): 739 fig. 126 (1909); Labillardière, *Nov. Holl. Plant. Specim.* 2: t. 219 (1806), as "*C. littorea*".

Vern.: Strand Sedge (Spreading Sedge). *Distr.*: Scattered through lowland Victoria on open sandy ground and locally frequent by the coast or along inland waterways (Far North-west, Wyperfeld Nat. Park, mouth of Glenelg R., Maribyrnong R., Port Melbourne, Dromana, Wilson Prom., Lakes Entrance, Marlo, Cape Conran, Mallacoota, Lake Omeo); all States except W.A. (?), Lord Howe Id, N.Z., Chile, Japan, China, Korea.

—Culms *well exerted* beyond leaf-sheaths; male spikes usually more than 4, the females spaced *at a distance beneath*; utricles 4-5 mm. long:

604. *C. bichenoviana* Boott *Ill. Gen. Carex* 1: 44, t. 110 (1858).

Illust.: Boott (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 230 (1943).

Vern.: Sedge. *Distr.*: Widespread on open, damp sandy or loamy soils in western and northern Victoria, being abundant and sometimes troublesome in irrigation districts, especially the Goulburn Valley (St. Albans, Little R. near Werribee, Mt. Emu Ck, Yarriambiack Ck, Wail, Dimboola, Wimmera R., Richardson R., Boort, Swan Hill, Murchison, Nathalia, Cobram, Dookie, etc.); Tas. (north coast), S.A., N.S.W.

26. Male glumes very narrow, *with a terminal awn* as long as the blade; utricles *dark-coloured, almost globular* and boldly many-nerved (spikes all terminal and close together):

605. *C. brownii* Tuckerm. *Enum. Caric.* 21 (1843).

Illust.: Kükenenthal, *Pflanzenreich* IV 20 (Heft 38): 613 fig. 104 A-D (1909); Boott, *Ill. Gen. Carex* 4: t. 532 right-hand fig. (1867).

Vern.: Sedge. *Distr.*: Widespread along watercourses throughout the cooler parts of Victoria, except the alps, but uncommon (Hawkesdale, Curdie's R., Ballarat, Mansfield, Ovens R., Snowy Ck, Towong on Upper Murray R., Cobungra, sources of Bemm R.); N.S.W., N.Z., N.G., Japan.

—Male glumes *without awns*; utricles *pale, never globular* (spikes not all terminal and approximate) 27

27. Leaves and major bracts *circinnate*; utricles *coriaceous*, with rib-like margins and bold divergent teeth, about *as long as* female glumes (spikes very dense, short and resembling *Plantago lanceolata*):

606. *C. tasmanica* Kükenenth. in *Bull. Herb. Boiss.* sér. 2, 4: 59 (1904).

Illust.: Kükenenthal, *Pflanzenreich* IV 20 (Heft 38): 688 fig. 118 H-L (1909).

Vern.: Sedge. *Distr.*: Known in Victoria by a single collection from Heywood township in the south-west (Nov. 1948), and perhaps introduced there; otherwise not recorded beyond southern Tasmania.

—Leaves and bracts *not circinnate*; utricles *membranaceous*, manifestly *longer than* female glumes at maturity 28

28. Utricles \pm 5 mm. long, *strongly nerved*, with almost *terete* beak 1-2 mm. long (inflorescence *hardly exceeding* the leaves):

607. *C. gunniana* Boott in *Trans. Linn. Soc. Lond.* 20: 143 (1846).

Illust.: Boott, *Ill. Gen. Carex* 1: t. 185 (1858).

Vern.: Sedge. *Distr.*: Scattered through cooler southern parts of Victoria where occasional on swampy ground beside streams (Lower Glenelg R., Grampians, Hawkesdale, Curdie's R., Garvoc, Beenak, junction of Mitchell and Dargo Rivers), but apparently rare east of Melbourne; Tas., S.A., N.S.W.

—Utricles 3-4 mm. long, *faintly nerved*, with short *flattened* beak <1 mm. long (inflorescence usually *much longer than* leaves—alpine species):

608. *C. blakei* E. Nelmes in *Kew Bull.* 1939: 311 (1939).

Illust.: Nil.

Vern.: Sedge. *Distr.*: Widespread through the Victorian alps at altitudes above 4500 ft. and locally frequent in bog and fen formations (Lake Mountain, Mt. Torbreck, Baw Baws, Mt. Wellington, Mt. Buffalo, Bogong High Plains, Cobboras, Nunniong Plateau); similar terrain in the Kosciusko region of N.S.W.

[The species was hitherto confused with lowland *C. gunniana* from which it has been segregated.]

Family 42. PALMÆ [Arecaceæ, Phœnicaceæ]

191. LIVISTONA R. Br. (1810)

609. *L. australis* (R. Br.) Mart. *Hist. nat. Palm.* 241 (1838-9).

Corypha australis R. Br. *Prodr. Flor. Nov. Holl.* 267 (1810).

Illust.: Willis, *Aust. Encycl.* 6: 442 (1958); Guilfoyle in Audas, *Native Trees Aust.* 231 (1934); Adam in Ewart, *Handb. For. Trees* t. 10 (1925); King in Maiden, *For. Flor. N.S.W.* 7: t. 256, tt. opp. 361 (1921); Reeves in Pescott, *Native Flowers Vict.* t. opp. 94 (1914); Guilfoyle, *Aust. Plant.* 203 (1910); Williamson, *Vict. Nat.* 28: t. 2 opp. 73 (1911); Spencer, *Vict. Nat.* 6: fig. 2-3 opp. 8 (1889); Herter, *Flor. il. Uruguay* 1: fig. 726 (1943); Fitch in *Curtis's bot. Mag.* 103: t. 6274, col. (1877).

Vern.: Cabbage Fan-palm (Cabbage-tree Palm, Kondo—N.Qd aborig.). *Distr.*: Very rare and localized in Victoria where known only from three small colonies on Cabbage Tree Ck, Caley's Ck and the lower Brodribb R. (only a few specimens in each locality and all within 12 miles of Orbost); also near-coastal gullies in N.S.W. and Qd (extending into tropics where scattered).

Diagn.: Palm-tree, attaining 90 ft. or more in height, with single straight trunk 6-12" wide) bearing greyish-brown annular leaf scars; leaves in a dense ovoid-oblong crown; blades orbicular, fan-like, 3-4 ft. in diameter when fully expanded, cut to about the middle into 30-50 radiating, narrow, plicate, acuminate lobes that are entire or bifid at the drooping tips; petioles 3-4 ft. long, tough, rigid, spreading to decurved, armed below with strong, marginal recurved spines 5-10 mm. long (like sharks' teeth); panicle 3-4 ft. long, glabrous, drooping, repeatedly branched, the larger branches \pm angular, the ultimate divisions or spikes 1-3" long; spathes subtending panicle leathery, lanceolate, 6-12" long, \pm tomentose; flowers pale, with 3 short, very broad, obtuse calyx-segments (1-1.5 mm. long) and 3 fleshy, triangular-ovate, subacute petals (\pm 3 mm. long); anthers 6, on short broad, filaments; carpels 3, each with short blunt stigma; fruit a hard, globular, 1-seeded drupe 12-20 mm. wide, the crustaceous pericarp granular; seed smooth with pale brown testa.

[*Phoenix canariensis* Hort. ex Chabaud (Canary Date Palm), from the Canary Is., is a hardy species widely planted in suburban streets and gardens of Melbourne and warmer northern parts of Victoria. Birds probably distribute the copious seeds, and young spontaneous seedlings are not infrequently found. This palm has a massive trunk, arcuate pinnate leaves to 20 ft. long and spinescent leaflets toward the broadened petiole-bases.]

Family 43. *ARACEÆ

192. *ZANTEDESCHIA Spreng. (1826)

610. *Z. *æthiopica* (L.) Spreng. *Syst. Veg.* 3: 765 (1826).

Calla æthiopica L. *Spec. Plant.* 2: 968 (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 231 (1943); Herter, *Flor. il. Uruguay* 1: fig. 746 (1943); Boynton & Becker, *Addisonia* 12: fig. 399 (1927); Bailey, *Standard Cycl. Hort* new. ed. 3: fig. 4029-31 (1925); Makino, *Ill. Flor. Jap.* 728 (1924); Dixie in Marloth, *Flor. S. Afr.* 4: t. 13 fig. B, col. (1915), also Dyke in Marloth *l.c.* t. 14 (1915); Engler in *Pflanzenreich* IV 23 Dc (Heft 64): 63 fig. 28 (1915); Britton, *Flor. Bermuda* 60 (1918); Edwards in *Curtis's bot. Mag.* 21: t. 832, col. (1805), as "*Calla æthiopica*"; Rice, *Wild Flowers Cape G.H.* t. 248, col. (1951).

Vern.: White Arum Lily (Calla Lily, Pig Lily, Lily-of-the-Nile). *Distr.*: Indigenous to South Africa; introduced into many countries for garden ornament and often persisting as an escape, e.g. in S. Amer., Japan, N.Z. (North Id), W.A. (Albany, Busselton etc.), S.A. (Mt. Lofty Range) and Victoria where spontaneous at Cape Schanck, near Nar-Nar-Goon, on Doughboy Id (off Wilson Prom.) and occasionally on Melbourne suburban allotments—especially in damp situations.

Diagn.: Fleshy perennial herb to 5 ft. high, with thick rhizomic root-stock; leaves large, radical, with white sheathing bases; blades dark green, 6-18" long, 4-10" wide, narrowly ovate, cordate or hastate at base, acute or obtuse but tipped with a subulate point; flowering spathe raised as high as foliage or slightly higher, large, white, 4-10" long, obliquely funnel-shaped, slit down one side to the base and with a long recurving point at the summit, soft and kid-like to touch; spadix bright yellow, almost sessile, 2-4" long, 5-10 mm. thick, the upper two-thirds (or more) occupied by numerous, minute, sessile, densely packed anthers that dehisce by terminal pores (emitting pollen in sausage-like strings), the much shorter lower part bearing several spirals of subglobose, short-styled, 2- to 5-locular ovaries, all these minute flowers lacking perianths; fruit a green or yellowish berry, 5-10 mm. long and somewhat angular from mutual pressure.

[Also tending to persist in old Victorian gardens, the South European *Arum italicum* Mill. (Italian Cuckoo-pint or Aaron's-rod) is notable for its whitish-veined sagittate leaves, hooded yellow-green spathes and attractive scarlet berries that ripen in summer. It was noted as spontaneous at Kalimna Jetty, Gippsland Lakes, in Aug. 1944.]

Family 44. LEMNACEÆ

Plant *rootless, subglobose*; flowers (when present) borne on *surface* of thallus, the male *solitary* and with 1-locular anther

194. *Wolffia*

Plant *bearing roots*, distinctly *flattened* (much broader than thick); flowers borne on *margins* of thallus, the male *in pairs* and with 2-locular anthers

193. *Lemna*

193. LEMNA L. (1753)

1. Thallus floating but *submerged, translucent*, 5-15 mm. long, oblong to lanceolate in outline and narrowed abruptly *into a stalk* at one end, budding *from opposite sides* into secondary plants; root 1 to each thallus:

611. *L. trisulca* L. *Spec. Plant.* 2: 970 (1753).

Illust.: Williamson, *Vict. Nat.* 44: 241 fig. 3 (1928); White in Bailey, *Compr. Cat. Qd Plant.* 581 fig. 559 (1913); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 159 (1957); Herter, *Flor. il. Uruguay 1*: fig. 754 (1943); Abrams, *Ill. Flor. Pacific States 1*, ed. 2: fig. 847 (1940); Kuseneva, *Flor. U.R.S.S. 3*: t. 26 fig. 7 (1935); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 946 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg. 11*: fig. 2801, col. (1930-31); Coste, *Flor. Franc. 3*: fig. 3674 (1906); Javorka & Csapody, *Icon. Flor. Hungar.* 69 (1929); Bose, *Manual Ind. Bot.* 15, 300 (1920); Arber, *Water Plant.* t. 79, 81 (1920); Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 263 (1909); Thompson, *Rep. Mo. bot. Gdn.* 9: t. 2 fig. c (1898); Hegelmaier, *Lemnaceen* t. 5, t. 6 fig. 1-18 (1868); Reichenbach, *Icon. Flor. germ.* 7: t. 15 n. 19, col. (1845).

Vern.: Ivy-leaf Duckweed. *Distr.*: Scattered through the cooler parts of western Victoria in stagnant water, but uncommon (near the Grampians, Hawkesdale, Lake Terang, Forrest, Geelong district), an old Murray R. record being dubious; all States, N. & S. Amer., Eurasia, N. Afr.

—Thallus floating on the surface, ovate to orbicular, without stalk

2

2. Root 1 per thallus (plant 2-4 mm. wide):

612. *L. minor* L. *Spec. Plant.* 2: 970 (1753).

Illust.: Ewart, *Flor. Vict.* fig. 137 (1931); Williamson, *Vict. Nat.* 44: 241 fig. 2 (1928); White in Bailey, *Compr. Cat. Qd Plant.* 581 fig. 560 (1913); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 161 a-i (1957); Abrams, *Ill. Flor. Pacific States 1*, ed. 2: fig. 850 (1940); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 947 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg. 11*: fig. 2803, col. (1930-31); Coste, *Flor. Franc. 3*: fig. 3675 (1906); Javorka & Csapody, *Icon. Flor. Hungar.* 69 (1929); Horwood, *Brit. Wild Flowers 4*: t. 43 (1919); Marloth, *Flor. S. Afr.* 4: 55 fig. 1 (1915); Clements, *Rocky Mount. Flor.* t. 44 (1914); Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 264 (1909); Thompson, *Rep. Mo. bot. Gdn.* 9: t. 2 fig. b (1898); Hegelmaier, *Lemnaceen* tt. 9 & 10 (1868); Reichenbach, *Icon. Flor. germ.* 7: t. 14 n. 15, col. (1845).

Vern.: Common Duckweed (Lesser Duckweed). *Distr.*: Widespread through southern and central Victoria and not infrequent on still water of ponds, ditches, lagoons and river backwaters (e.g. Casterton district, Warrnambool, Stony Rises near Colac, Mt. Kooroocheang, Barwon R. near Geelong, Altona, Melbourne district, King Parrot Ck, Quail Id, Tarago R. near Drouin, Wilson Prom., Sperm Whale Head); all States, N.Z., cosmopolitan excepting polar and tropic regions.

—Roots 3-8 per thallus (plant thin, 3-6 mm. wide):

613. *L. oligorrhiza* Kurz in *J. Linn. Soc. Lond.* 9: 267 (1866).

Spirodela oligorrhiza (Kurz) Hegelm. *Lemnaceen* 147 (1868).

Illust.: Williamson, *Vict. Nat.* 44: 241 fig. 4 (1928), as "*Spirodela oligorrhiza*"; White in Bailey, *Compr. Cat. Qd Plant.* 581 fig. 561 (1913); Lancaster, *Trans.*

N.Z. Inst. 60: t. 63 opp. 563 (1930); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 163 (1957), as "*Spirodela oligorrhiza*"; Saeger, *Bull. Torrey bot. Cl.* 61: t. 13 fig. 1-15, 17 (1934), as "*Spirodela oligorrhiza*"; Miki, *Bot. Mag., Tokyo* 48: 333 (1934), as "*Spirodela oligorrhiza*"; Hegelmaier, *Lemnaceen* t. 16 (1868), as "*Spirodela oligorrhiza*".

Vern.: Thin Duckweed. **Distr.:** Scattered on lagoons and river backwaters of the Murray Valley and Gippsland in Victoria, but localized and uncommon (Junction of Murray R. & Darling R., Tullah Ck between Barmah & Tocumwal, Upper Murray above Albury, Cann R., Lakes Entrance, Waterloo), a Barwon R. record being of doubtful origin; all States except Tas. (?), N.Z. (near Palmerston North), N. Cal., Japan, Malaya, India, Java, Polynesia, U.S.A. (Missouri & California where perhaps introduced).

—Roots > 8 and up to 16 per thallus (plant thickish, 5-10 mm. wide, often purplish beneath):

614. *L. polyrhiza* L. *Spec. Plant.* 2: 970 (1753)—etymol. orig.

Spirodela polyrrhiza (L.) Schleid. in *Linnæa* 13: 392 (1839).

Illust.: Williamson, *Vict. Nat.* 44: 241 fig. 5 (1928), as "*Spirodela polyrrhiza*"; White in Bailey, *Qd agric. J.* n. ser. 2: 78 t. 39 (1914); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 164 (1957), as "*Spirodela polyrrhiza*"; Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 846 (1940), as "*Spirodela polyrhiza*"; Kuseneva, *Flor. U.R.S.S.* 3: t. 26 fig. 6 (1935), as "*Spirodela polyrrhiza*"; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 949 (1931); Poinsoot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2802, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3673 (1906); Javorka & Csapody, *Icon. Flor. Hungar.* 69 (1929); Thompson, *Rep. Mo. bot. Gdn* 9: t. 1 fig. A (1898), as "*Spirodela polyrrhiza*"; Hegelmaier, *Lemnaceen* t. 13 fig. 10-16, tt. 14 & 15 (1868), as "*Spirodela polyrrhiza*"; Reichenbach, *Icon. Flor. germ.* 7: t. 15 n. 17, col. (1845).

Vern.: Large Duckweed (Greater Duckweed). **Distr.:** Very localized and rare in Victoria, where known by only two collections from lagoons on the far Upper Murray R., viz. Towong (Jan. 1874) and Biggara (Nov. 1928); N.S.W., Qd, Eurasia, Africa, Madeira, N. & S. Amer.

194. WOLFFIA Hork. ex Schleid. (1839)

615. *W. arrhiza* (L.) Hork. ex Wimm. *Flor. Schles. Handb.* ed. 3: 140 (1857).

Lemna arrhiza L. *Mant. Plant.* 2: 294 (1771).

Illust.: Williamson, *Vict. Nat.* 44: 241 fig. 1 a-b (1928); White in Bailey, *Compr. Cat. Qd Plant.* 581 fig. 558 (1913); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 165 e-g (1957); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 950 (1931), as "*Lemna arrhiza*"; Poinsoot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2805, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3677 (1906); Javorka & Csapody, *Icon. Flor. Hungar.* 69 (1929); Marloth, *Flor. S. Afr.* 4: 55 fig. 4-5 (1915); Hegelmaier in Hegi *Ill. Flor. Mittel-Eur.* 2: fig. 261 a-e (1909); Hegelmaier, *Lemnaceen* t. 2 fig. 6-17, t. 3 fig. 1-12 (1868); Reichenbach, *Icon. Flor. germ.* 7: t. 14 n. 14, col. (1845), as "*Lemna arrhiza*".

Vern.: Tiny Duckweed (Rootless Duckweed). **Distr.:** Except for occurrences at Cann R. and Boneo on the Mornington Peninsula, apparently confined in Victoria to cooler parts of the Western District where temporarily colonizing still water of ponds, lakes and swamps, especially on basaltic land (near

Casterton, Mt. Emu Ck, Lake Terang, Stony Rises near Colac, Ballarat, Geelong district, Melbourne where very rare); all States except Tas. (?), Java, Philippines, Eurasia, Africa, N. & S. Amer.

Diagn.: The smallest flowering plant in Australia, consisting of a thick rootless lamina or disk about 1 mm. in diameter and 1 mm. deep, very convex beneath so as to be almost hemispherical; new laminae budding off rapidly from a pit on the upper surface, to form extensive, continuous floating scums on stagnant water; flowers rare, but, when present, borne on surface of disk and microscopic; male flower solitary, with single 1-locular anther; female flower solitary, spatheless, with a 1-sided carpel.

[There is uncertainty as to whether Victorian occurrences are really conspecific with the European *Wolffia arrhiza*, and critical comparison of both—in the flowering state—is a desideratum. Possibly also, some Australian populations at present included with *Lemna* species of boreal regions may warrant segregation as subspecies at least. It is singular that the tumid *L. gibba* L. should have appeared in Western Australia and north-eastern New Zealand, but nowhere between.

See "The Lemnaceæ, or Duckweeds" by W. S. Hillman in *Bot. Rev.* 27: 221-287 (1961).]

Family 45. RESTIONACEÆ

FEMALE PLANTS

1. Flowers *not arranged in spikelets*, pedicellate or sessile in loose or spike-like panicles; perianth hyaline, usually longer than the loose subtending bract and 2 bracteoles; fruit a depressed capsule, opening at the 3 angles; seeds normally 1 to each of the 3 loculi

195. *Lepyrodia*

Flowers aggregated in *definite spikelets* with closely imbricate glumes or, if solitary, then the fruit an indehiscent 1-seeded nut

2. Leaf-sheaths all or mostly *deciduous* (loose, broad and chaffy); spikelet single and several-flowered, terminating the naked flexuose culm; style single, undivided; fruit a 1-seeded nut (on sandy western and mallee heaths)

197. *Lepidobolus*

Leaf-sheaths *persistent*, usually close-appressed, green, *woolly* at orifice, with short spreading subulate blades; spikelet sessile, 1-flowered, lateral (toward apex of filiform culm); styles 2-3; fruit a 1-seeded nut

200. *Calorophus*

Leaf-sheaths *never deciduous*, woolly at orifice *only* when spikelet is pedicellate and several-flowered

3. Spikelets rather few (sometimes isolated), 1- to 3-flowered; upper branches of culm with *few* (<12) but distinct *whitish striae*; fruit an indehiscent 1-seeded nut (styles 3)

199. *Hypolana*

Spikelets few to very numerous, 3-flowered or more; upper branches of culm with *numerous* indistinct and very fine *striae*; fruit dehiscent

4. Spikelets \pm *sessile*, very congested, 3- to 6-flowered; ovary with 1 loculus and 1 ovule (styles 3)

198. *Leptocarpus*

Spikelets *pedicellate*, loosely arranged, *many-flowered*, the shining brown glumes with long setaceous points; ovary with 2 loculi and 2 ovules (styles 2)

196. *Restio*

MALE PLANTS (shortened key)

1. Flowers distinct, *not* arranged in spikelets but stalked in short panicles or forming numerous isolated \pm sessile clusters along filamentous culms; glumes gaping, hardly imbricate (leaf-sheaths very broad, never woolly at orifice) 195. *Lepyrodia*
Flowers aggregated in definite spikelets; glumes closely imbricate 2
2. Leaf-sheaths broad, loose and soon deciduous; spikelet solitary terminal 197. *Lepidobolus*
Leaf-sheaths persistent 3
3. Spikelets sessile, 2 or 3 together within isolated floral bracts along the filiform branch, each spikelet 2- to 3-flowered and \pm 3 mm. long (leaf-sheaths usually woolly at orifice) 200. *Calorophus*
Spikelets numerous and pedicellate in diffuse panicles, or, if few, then many-flowered and >3 mm. long 4
4. Staminal filaments long, the anthers *exserted* beyond glumes which have aristate apices; spikelet ovoid to \pm globular, 3-5 mm. wide 196. *Restio*
Staminal filaments very short, the anthers *not exserted*; glumes obtuse to acute but hardly aristate; spikelets to 3 mm. wide (but then *not* globular), very numerous and nodding 5
5. Ultimate branches of culm with *few* (<10) but distinct *whitish striæ*; spikelets 4-5 mm. long, on white-woolly pedicels 199. *Hypolæna*
Ultimate branches of culm striated with *numerous* fine indistinct lines; spikelets 5-10 mm. long if on white-woolly pedicels, but only 2-4 mm. if not 198. *Leptocarpus*

195. LEPYRODIA R. Br. (1810)

1. Culms *unbranched, straight, without sheathing scales* (except at very base), 10-20" tall, filiform to slightly complanate; inflorescence entirely terminal, \pm 1" long; 3 inner perianth segments shorter than the 3 outer:

616. *L. anarthria* F. Muell. *Fragm. Phyt. Aust.* 8: 73 (1873).

Illust.: Nil.

Vern.: Scale-rush. *Distr.*: Restricted in Victoria to the extreme south-east, where occasional on damp heaths at Maramingo Ck and the Upper Genoa R. (both localities within 4 miles of the N.S.W. border); also N.S.W.

—Culms *loosely branched, \pm flexuose*, 1-2 ft. long; sheathing scales *conspicuous* throughout; flowers in small, \pm sessile, distant clusters along the upper 3-9" of slender spike-like branches; inner perianth-segments equal to or longer than the outer:

617. *L. interrupta* F. Muell. *Fragm. Phyt. Aust.* 8: 74 (1873).

Illust.: Nil.

Vern.: Twisting Scale-rush (Knotted Scale-rush). *Distr.*: Confined in Victoria to the Grampians, on moist peaty ground where not uncommon; also N.S.W., Qd. [Superficially resembling *Calorophus lateriflorus* (q.v.), and sometimes confused with it.]

—Culms neither simple and without scales *nor* flexuose with many remote sessile clusters of flowers (inflorescence a narrow panicle) 2

2. Branches *few or none, smooth*; subtending bracts of inflorescence hyaline above, the apex hair-like but soon torn; inner perianth-segments of both male and female flowers *no longer* than the outer (often shorter):

618. *L. muelleri* Benth. *Flor. aust.* 7: 215 (1878).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 233 (1943).

Vern.: Common Scale-rush (Erect Scale-rush). *Distr.*: Rather common on poor sandy heaths, and chiefly coastal, from the Lower Glenelg R. to far East Gippsland (e.g. Poolaigelo, Grampians & Black Range, eastern Port Phillip, Narre Warren North, Quail Id in Western Port, Port Albert, Merriman's Ck, Fernbank, Cann & Thurra Rivers); Tas, S.A., N.S.W.

—Branches *numerous* (the primary culm dividing 3 or more times), minutely but *distinctly verruculose*; subtending bracts of inflorescence with firm, indurated, rather obtuse, awn-like points; inner perianth-segments of male flowers *much longer* than the outer (segments nearly all equal in females):

619. *L. tasmanica* Hook. f. *Flor. Tasm.* 2: 72, t. 135 fig B (1858).

Illust.: Fitch in Hooker f. (*l.c.*, col.).

Vern.: Branching Scale-rush. *Distr.*: Confined in Victoria to the Grampians where widespread (e.g. Hall's Gap, Mt. William, Upper Glenelg R.), chiefly on swampy ground along watercourses but rather infrequent; also Tas. (apparently common on wet heaths).

[The record of *L. scariosa* R. Br. in Ewart's *Flor. Vict.* 255 (1931) was based upon a mis-identification of *L. muelleri* from the Grampians (Victoria Range, Nov. 1902 & Dec. 1903). The former species is restricted to New South Wales and Queensland, and may be distinguished by the large, *thick, spreading stem-bracts*, as well as by the *long fine points* of its floral bracts.]

196. RESTIO L. (1767)

Culm *terete*, 2-5 ft. high, bearing clusters of numerous filiform, *much-divided*, vivid green barren branches; spikelets of both sexes numerous, ovoid to almost globular, tassel-like in loose panicles:

620. *R. tetraphyllus* Labill. *Nov. Holl. Plant. Specim.* 2: 77, t. 226-227 (1806).

Illust.: Labillardière (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 232 (1943); Baillon, *Hist. Plant.* 12: fig. 365 (1894).

Vern.: Tassel Cord-rush (Feather Plant—Qd). *Distr.*: Not uncommon along sluggish streams or around ponds and swamps on heathland in southern Victoria, from the Lower Glenelg R. to East Gippsland (e.g. Wannon R., Grampians, Horsham, Condah, Curdie's R., Aire R., Frankston, Tonimbuk & Bunyip R., Moe, Waratah Bay, Wilson Prom., Cape Conran, Newton's Ck., Reedy & Dinner Cks near Cann R.); all States except W.A., but very localized in S.A. (sphagnum bog near Millicent).

Culm *distinctly flattened, unbranched*, seldom > 2 ft. high; all sheathing scales closely appressed; spikelets rather numerous, ovoid-oblong, tassel-like and long-stalked in narrow panicles:

621. *R. complanatus* R. Br. *Prodr. Flor. Nov. Holl.* 245 (1810).*Illust.*: Nil.

Vern.: Flat Cord-rush. *Distr.*: In Victoria apparently confined to damp heaths in the south-west and in East Gippsland (Lower Glenelg R., Portland, Grampians & Black Range, Cape Conran, Cann R., Dinner Ck, Thurra R. etc.), but locally common; all States except W.A., but very localized in S.A. (Kangaroo Id—a somewhat dubious record).

Culm *terete*, *unbranched*, rather stout and rigid, up to 2 ft. high (often much less); at least the upper sheathing scales large (20 × 5 mm.) loose and thick; spikelets few, ovoid, rather large (to 12 × 6 mm.), erect, shortly stalked or sessile within the upper bracts (plant of alpine and montane bogs):

622. *R. australis* R. Br. *Prodr. Flor. Nov. Holl.* 245 (1810).*Illust.*: Nil.

Vern.: Mountain Cord-rush (Austral Cord-rush). *Distr.*: A frequent component of bogs and moss-beds in the more eastern alps and subalps of Victoria (Mt. Wellington, Dargo & Bogong High Plains, Cobungra, Mt. Cobbler, Nuniong Plateau, Cobboras, sources of Buckwong R., Ingeegoodbee R., Upper Delegate R. flats near Bendoc & Bidwell); Tas., N.S.W., extreme S.E. Qd (near Stanthorpe).

[The recording of *R. gracilis* R. Br. for Victoria—*q.v.* in Ewart's *Flor. Vict.* 256 (1931)—is erroneous; it was based upon mis-determined specimens of *R. australis*. The former species occurs only in New South Wales and Queensland, differing from *R. australis* in its smaller more numerous spikelets and slender culms with tightly appressed sheathing scales.]

197. LEPIDOBOLUS Nees (1846)

623. *L. drapetocoleus* F. Muell. *Fragm. Phyt. Aust.* 8: 84 (1873).*Illust.*: Black, *Flor. S. Aust.* ed. 2: fig. 242 (1943).

Vern.: Scale-shedder (Curly Chaff-rush). *Distr.*: Confined in Victoria to drier inland heaths of the far west, but of scattered occurrence (Victoria and Black Ranges in western Grampians, Poolaigelo, Dimboola, Big and Little Deserts, Lake Hindmarsh, Wyperfeld Nat. Park); also S.A.

Diagn.: Rigid wiry perennial about 1 ft. high, the thick woolly rhizomes creeping extensively through sand; culms unbranched, 1-1.5 mm. thick, smooth, ± shining, gently flexuose below but very sinuous and snake-like above, with 6-9 distant dark rings that mark the attachments of deciduous sheathing bracts; bracts loose, 10-15 mm long, 4-5 mm. wide when flattened out, narrowly elliptic, blunt with short apical mucro, brown but paler at margins, internally pale and shining, soon falling away and lying around base of plant like flakes of chaff; male flowers in bright brown terminal globular heads 5-7 mm. wide, with numerous imbricate blunt but mucronate glumes (2-3 mm. × 1-2 mm.) bearing an apical tuft of short white-woolly hairs; anthers 3, pointed, ± 1.5 mm. long, on slender filaments; female flowers in shortly cylindrical terminal heads ± 7 × 2 mm., with few tightly overlapping glumes the upper 5-6 of which have black, divergent, awn-like points 2-4 mm. long; style simple, filiform; fruit a small 1-seeded nut; perianth of both sexes with 5 scarious segments each 2-3 mm. long, the 2 outer broader, concave and ± ciliate above, the 3 inner flat.

198. LEPTOCARPUS R. Br. (1810)

Male spikelets *rather few*, 5-10 mm. long, on conspicuous *white-woolly* pedicels, the glumes acuminate; female spikelets <6 mm. long, *numerous, densely and irregularly clustered* into compact spike-like panicles (either interrupted or, more often, almost capitate), the glumes suddenly contracting into a fine acumen or mucro:

624. *L. brownii* Hook f. *Flor. Tasm.* 2: 73, t. 136 (1858).

Illust.: Fitch in Hooker f. (*l.c.*, *col.*); Black, *Flor. S. Aust.* ed. 2: fig. 237-238 (1943).

Vern.: Coarse Twine-rush. *Distr.*: Widespread in Victoria on both dry and wet heaths, from the Big Desert south and easterly to Gabo Id, often tolerating saline soils and locally frequent (e.g. Little Desert, Dimboola, Grampians, Poolaigelo, Lower Glenelg R., Portland, Point Lonsdale, Frankston, Quail Id in Western Port, Yanakie, Lakes Entrance, Cape Conran, Wingan Inlet); Tas., N.S.W., S.A., ? W.A.

Male spikelets *numerous*, 2-4 mm. long, the pedicels *glabrous or almost so* and the glumes obtuse; female spikelets \pm 10 mm. long, *few*, rigidly erect, \pm cylindrical and *almost free*, the glumes regularly imbricate and tapering gradually into a firm acumen:

625. *L. tenax* (Labill.) R. Br. *Prodr. Flor. Nov. Holl.* 250 (1810).

Schœnodum tenax Labill. *Nov. Holl. Plant. Specim.* 2: 80, t. 229 (1806).

Illust.: Labillardière (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 235-236 (1943); Blackall, *How to Know W. Aust. Wildflowers* 1: 55 (1954); Engler & Drude, *Veg. Erde* 7: 144 (1906).

Vern.: Slender Twine-rush. *Distr.*: Apparently restricted in Victoria to far western and Gippsland heaths, but locally not uncommon (Little Desert, Black Range & Grampians, Lower Glenelg R., Waratah Bay, Wilson Prom., Marlo, Tamboon Inlet, Mt. Drummer, Maramingo Ck beyond Genoa); all States.

199. HYPOLÆNA R. Br. (1810)

626. *H. fastigiata* R. Br. *Prodr. Flor. Nov. Holl.* 251 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 239-240 (1943); Fitch in Hooker f., *Flor. Tasm.* 2: t. 137, *col.* (1858).

Vern.: Tassel Rope-rush. *Distr.*: Abundant on sandy heaths of western and southern Victoria, from the Big Desert to Cape Howe (e.g. Little Desert, Black Range & Grampians, Poolaigelo, Upper & Lower Glenelg R., Anglesea, Torquay, Frankston, Tonimbuk, Quail & Sunday Is, Waratah Bay, Wilson Prom., Marlo, Mallacoota); all States except W.A.

Diagn.: Tough rhizomic perennial with slender, ascending or upright much-branched stems 1-2 ft. high; branches \pm flexuose, 0.5-1.5 mm. thick, at least the upper bearing up to 12 distinct, longitudinal, mealy-white striæ; sheathing bracts dark, tightly appressed, numerous, striated, to 10 mm. long, apically blunt but with short erect mucro; male spikelets very numerous, ovoid-ellipsoid, to 6 mm. long, on slender whitish pedicels in a loose terminal panicle, the numerous dark reddish-brown and shining glumes to 2.5 mm. long \times 1-1.5 mm. wide, obtusish but mucronate; anthers 3, broad, almost sessile, \pm 0.7 mm. long; female spikelets relatively few, subcylindric, 6-10 mm. long,

usually terminal and solitary on ultimate branches, the bright brown few glumes 4-6 mm. long and much more acuminate than in males; styles 2-3, black, scabrid, much exerted, to 10 mm. long or more; fruit a 1-seeded ovoid nut \pm 4 mm. long; male perianth golden-brown, \pm 1.5 mm. long, of 6 narrowish blunt segments, the 2 outer being strongly keeled; female perianth-segments 6, very broad and thin, \pm 1 mm. long, adhering to base of nut like hypogynous scales (as in *Lepidosperma*).

200. CALOROPHUS Labill. (1806)

627. *C. lateriflorus* (R. Br.) F. Muell. *Fragm. Phyt. Aust.* 8: 87 (1873)—ut "*Calostrophus*".

Restio lateriflorus R. Br. *Prodr. Flor. Nov. Holl.* 247 (1810);

Hypolæna lateriflora (R. Br.) Benth. *Flor. aust.* 7: 238 (1878).

Illust.: Mueller, *Key Syst. Vict. Plant.* 2: fig. 124 (1886).

Vern.: Spreading Rope-rush. *Distr.*: A frequent constituent of heathland swamps or stream edges in western, southern and eastern Victoria, ascending to bog and herbfield formations in the alps where abundant (e.g. Grampians & Black Range, Lower Glenelg R., Portland, Otways, Port Phillip region, Wandin, Upper Bunyip R., Arthur's Seat, Waratah Bay, Wilson Prom., Lake Mountain, Baw Baws, Mts Buller & Cobbler, Dargo & Bogong High Plains, sources of Buckwong R., Cobboras, Upper Delegate R. at Bidwell); all States except W.A., also N.Z.

Diagn.: Matted rhizomic perennial with very slender, much-branched, ascending stems from $<6"$ to 5 ft. long or more (where scrambling amongst dense undergrowth); branches bright green, 0.4-0.8 mm. thick, smooth or minutely scaberulous, flexuose; sheathing (as well as floral) bracts pale-greenish, closely appressed, 4-10 mm. long, with intricate woolly hairs at the obtuse apex, furnished with a divergent or reflexed and subulate blade 2-3 mm. long; male and female spikelets both axillary, sessile, solitary (or male in pairs) and distant; male flowers 2-3 per spikelet, with loose glumes 3-5 mm. long and 6 narrow, hyaline perianth-segments \pm 3 mm. long; anthers 3, pale, 1.5-2.0 mm. long, on slender filaments; female flowers solitary, with tight rigid subtending glume 5-8 mm. long and 4-6 broadly ovate, hyaline perianth-segments 1-2 mm. long; styles 2 or 3, filiform, pale, hirsute, exerted and recoiled; nut almost globular, \pm 1.5 mm. broad and long.

Family 46. CENTROLEPIDACEÆ

1. Inflorescence a head with 2 erect sheathing bracts which enclose 1-several bisexual flowers; ovary consisting of several superposed, 1-ovulate carpels (each with a style)

203. *Centrolepis*

Inflorescence with 4-16 bracts; flowers unisexual; ovary with a single 1-ovulate carpel

2

2. Flowers in a flat spike of 6-16 distichous imbricate bracts (the lowest 1 or 2 much longer than others); ovary sessile; anther 1-locular

202. *Aphelia*

Flowers red, in a depressed head subtended by 4-6 equal, spreading involucre bracts; ovary pedicellate, 3-angled and 3-styled but unilocular; anther 2-locular

201. *Trithuria*

201. TRITHURIA Hook. f. (1858)

628. *T. submersa* Hook. f. *Flor. Tasm.* 2: 78, t. 138 fig. A (1858).*Juncella submersa* F. Muell. ex Ewart *Flor. Vict.* 259 (1931).*Illust.*: Fitch in Hooker f. (*l.c.*, *col.*); Black, *Flor. S. Aust.* ed. 2: fig. 243 (1943).*Vern.*: Trithuria (*Juncella*). *Distr.*: Scattered through western and central Victoria on mud and around temporary pools, but locally not uncommon (Big and Little Deserts, Hawkesdale, Hopkins R., Yambuk near Port Fairy, Mt. Emu Ck, Axe R. near You Yangs, Graytown, with an isolated occurrence at Winton Swamp near Benalla); temperate parts of all States except Qd.*Diagn.*: Small glabrous ephemeral, to 2' high; leaves several, radical, filiform (<0.5 mm. wide), with \pm dilated hyaline bases; scapes 1-7, filiform, 1-4 cm. high, each with a terminal head of several reddish flowers subtended by a common involucre of 4-6 equal, spreading, ovate-lanceolate and 1-nerved bracts 2-4 mm. long; perianths absent; male flowers 2-6 at centre of head, each consisting of a slender filament and 2-locular anther 0.5-1 mm. long; female flowers usually 10-20, each consisting of a stalked ovary with 3 septate, entire or deeply bifid styles 0.5-0.8 mm. long; fruit a rosy, 3-angled capsule \pm 0.5 mm. long, with single obovoid seed 0.3 mm. long.

202. APHELIA R. Br. (1810)

Spike 3-4 \times 2-3 mm., *turned to one side*; bracts 6-8, the lowest 1 much longer than others which are \pm *obtuse* and 1-1.5 mm. long:629. *A. gracilis* Sond. in *Linnæa* 28: 227 (1856-57).*Illust.*: Fitch in Hooker f., *Flor. Tasm.* 2: t. 138 fig. c, *col.* (1858), as "*A. gunnii*".*Vern.*: Slender Aphelia. *Distr.*: Widespread on damp sandy ground in western Victoria and often abundant, but not reaching the Far North-west and of limited occurrence toward the north-east (e.g. Little Desert, Dimboola, Grampians, Glenelg R., Hawkesdale, near Ararat, Mt. Cole, Skipton, Creswick, Brisbane Range, Torquay, Frankston, Dandenong, Whipstick Scrub near Bendigo, Graytown, Baddaginnie); Tas. (north), S.A., N.S.W., W.A.Spike 4-6 \times 3-4 mm., *erect*; bracts 8-16, the lowest 2 longer than others which are *acuminately tipped* and 2-3 mm. long:630. *A. pumilio* F. Muell. in *Linnæa* 28: 226 (1856-57).*Illust.*: Black, *Flor. S. Aust.* ed. 2: fig. 244 (1943).*Vern.*: Dwarf Aphelia. *Distr.*: Almost co-extensive in Victoria with *A. gracilis*, but not at present known from the Little Desert or the north-east, more frequent about Port Phillip (Heathmont, Mt. Martha, Arthur's Seat, etc.) and with an isolated record for the Snowy R.; Tas. (north), S.A., N.S.W.

[G. Hieronymus in *Abh. naturf. Ges. Halle* 12: 206 (1873) assigned these two species to his own genus *Brizula* (1872), purporting to differ from *Aphelia* in their unisexual flowers—male in the lower part of each spike and female above. He is followed by Gilg-Benedict in *Natürlichen Pflanzenfamilien* ed. 2, XV a (1930) and Hutchinson in *Families Flowering Plants* ed. 2, 2 (*Monocotyledons*): 700 (1959); but, as Bentham observed in *Flor. aust.* 7: 200 (1878), specimens of the type species of *Aphelia* (*A. cyperoides* R. Br.) often show the lowermost 1 or 2 flowers to be *entirely male*, and this distinction *per se* (unless supported by strong genetical criteria) is not here considered sufficient to justify generic separation of *Brizula*.]

203. CENTROLEPIS Labill. (1804)

1. Scapes (and leaves) <1 cm. long, the peduncle 2-4 mm.; outer bract *broad* with curved awn, the inner narrower and pointless; flowers 3 (2 in outer bract, 1 in the inner); carpels 6-10 (*minute moss-like plants*, growing in cushions or tufts <1" in diameter):

631. *C. cephaliformis* F. M. Reader in *Vict. Nat.* 19: 97 (1902).

Illust.: Nil.

Vern.: Cushion Centrolepis. *Distr.*: Apparently endemic in western Victoria, where known only from damp sandy ground in the Little Desert near Dimboola, near Lake Hindmarsh, Wyperfeld & Kulkyne Nat. Parks, near Navarre and at Puzzle Flat near Bealiba, but doubtless overlooked because of its diminutive size and moss-like appearance.

—Scapes >1 cm. long or, if ever <1 cm. in depauperate states, then either the outer bract extremely narrow or straight-pointed 2

2. Bracts *not* twice as long as flowers 4

Bracts *glabrous*, >twice the length of flowers, at least the lower one terminating in a *long slender awn* (5-40 mm.) 3

3. Lower bract *narrow*, with \pm *curved capillary awn* 5-10 mm. long; upper bract *awnless*; flower *solitary*, with 5-25 carpels:

632. *C. polygyna* (R. Br.) Hieron. in *Abh. naturf. Ges. Halle* 12: 210 (1873).

Alepyrum polygynum R. Br. *Prodr. Flor. Nov. Holl.* 253 (1810).

Illust.: Lee, *Wild Life* 13: 356 (1951); Black, *Flor. S. Aust.* ed. 2: fig. 245 (1943); Baillon, *Hist. Plant.* 12: fig. 208-210 (1894).

Vern.: Wiry Centrolepis. *Distr.*: Widespread and locally abundant on damp, sandy and often saline ground of western Victoria, rare in the Far North-west, extending toward the north-east and with isolated occurrences in Gippsland (e.g. Big & Little Deserts, near Horsham, Dartmoor, Lower Glenelg R., Wannon R., Moyston, Whipstick Scrub near Bendigo, Axe R., Graytown, Baddaginnie, Seaholme, mouth of Yarra R., Foster, Sperm Whale Head); all States, Cent. Aust.

—Lower bract *very broad*, with *straight* \pm *flattened awn* 10-40 mm. long; upper bract similar but with *shorter awn*; flowers 10-40 per head, each with 3-6 carpels:

633. *C. aristata* (R. Br.) Roem & Schult. *Syst. Veg.* 1: 44 (1817).

Desvauxia aristata R. Br. *Prodr. Flor. Nov. Holl.* 253 (1810).

Illust.: Blackall, *How to Know W. Aust. Wildflowers* 1: 59 (1954); Lee, *Wild life* 13: 351 (1951); Black, *Flor. S. Aust.* ed. 2: fig. 246 (1943); Fitch in Hooker f., *Flor. Tasm.* 2: t. 138 D, col. (1858); Hutchinson, *Fam. Flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 418 (1959); Arber, *Bot. Gaz.* 74: t. 1 (1922); Engler & Drude, *Veg. Erde* 7: 153 (1906); Hieronymus in Engler & Prantl, *Natürl. PflFam.* II 4: fig. 4 E (1888).

Vern.: Pointed Centrolepis. *Distr.*: Frequent on damp ground in western Victoria, except the Far North-west (e.g. Big & Little Deserts, Dimboola, Mt. Arapiles, Grampians, Lower Glenelg R., Hawkesdale, Mt. Cole, Creswick, Brisbane Range, Otways, Arthur's Seat, Melbourne area, Seymour, Graytown), with an isolated occurrence at Marlo in E. Gippsland; temperate parts of all States.

4. Bracts *glabrous*, the lower with awn *shortly exceeding* the flowers which are <5 per head; carpels 5-8 (far western plant):

634. *C. glabra* (F. Muell.) Hieron. in *Abh. naturf. Ges. Halle* 12: 209 (1873).
Desvauxia glabra F. Muell. in *Linnaea* 28: 226 (1856-57).

Illust.: Blackall, *How to Know W. Aust. Wildflowers* 1: 59 (1954); Black, *Flor. S. Aust.* ed. 2: fig. 247 (1943).

Vern.: Smooth Centrolepis. *Distr.*: Widespread in north-eastern and western Victoria, except the Far North-west, on temporarily damp sandy ground (e.g. Big & Little Deserts, Dimboola, Lower Glenelg R., Hawkesdale, Yambuk near Port Fairy, Mt. Emu Ck., Charlton, Graytown, Winton Swamp near Benalla, Mt. Pilot near Beechworth), but not near Melbourne and absent from highlands; Tas. (central), S.A., W.A., N.S.W.

—Bracts *hairy*, both with awns *shortly exceeding* the flowers (8-20 per head); carpels 2-4:

635. *C. fascicularis* Labill. *Nov. Holl. Plant. Specim.* 1: 7, t. 1 (1804).

Illust.: Labillardière (*l.c.*); Payne in Bailey, *Weeds & suspect. poison Plant.* Qd fig. 358 A (1906); Schnizlein, *Icon. Fam. nat. Regn. veg.* 1: t. 44 (1845).

Vern.: Tufted Centrolepis. *Distr.*: Scattered through cooler parts of southern Victoria, from the Grampians to Cape Howe, and locally frequent on damp sand or moist rock-ledges but never alpine (e.g. Black Range, Curdie's R., Otways, Dandenongs, Frankston, Wilson Prom., Sale, Marlo, Cape Conran, Mt. Kaye, Ram Head, Mallacoota); temperate parts of all States except W.A.

—As for the last, but bracts with short mucros *hardly longer than* the flowers and carpels 5-6 (leaves distinctly hairy):

636. *C. strigosa* (R. Br.) Roem. & Schult. *Syst. Veg.* 1: 43 (1817).
Desvauxia strigosa R. Br. *Prodr. Flor. Nov. Holl.* 252 (1810).

Illust.: Lee, *Wild Life* 13: 356 (1951).

Vern.: Hairy Centrolepis. *Distr.*: Abundant almost throughout Victoria, except in the alps (e.g. in such dispersed localities as Kulkyn Nat. Forest, Big & Little Deserts, Grampians, Lower Glenelg R., Portland, Hawkesdale, Creswick, Wedderburn, Bealiba, Bendigo, Mt. Macedon, Brisbane Range, Lorne, Torquay, Port Phillip region, Graytown, Rushworth, Avenel, Beechworth, Corner Inlet, Sperm Whale Head, Marlo, Mt. Kaye, Genoa R. gorge, Gabo Id); all States, but only in extreme south of Qd (near Wallangarra), N.Z. (Otago region).

Family 47. XYRIDACEÆ

204. XYRIS L. (1753)

1. Leaves \pm 1-2 ft. long; culms to 5 ft. high; heads *massive*, 4-5 mm. wide; bracts *very numerous*, in 5 rows, often \pm fringed at the tips, the many lower empty ones *progressively smaller*; style *not* deeply cleft; apex of capsule large, *hard*, *indehiscent*:

637. *X. operculata* Labill. *Nov. Holl. Plant. Specim. 1*: 14, t. 10 (1805).

Illust.: Labillardière (*l.c.*); Edwards in *Curtis's bot. Mag.* 29: t. 1158, col. (1808); Black, *Flor. S. Aust.* ed. 2: fig. 249 (1943); Williamson, *Vict. Nat.* 45: 162 fig. 1 (1928); Ewart, *Plant. indig. Vict.* t. 97 opp. 34 (1910), as "*X. gracilis*"; H.B.S. in Mueller, *Key Syst. Vict. Plant.* 2: fig. 122 (1886), as "*X. gracilis*"; Meredith, *Bush Friends Tasm.* t. 6, col. (1860); Schnizlein, *Icon. Fam. nat. Regn. veg. 1*: t. 47 fig. 3-9 (1845).

Vern.: Tall Yellow-eye. *Distr.*: A frequent constituent of heathland swamps in southern Victoria, from the Lower Glenelg R. to Cape Howe (e.g. Grampians, Black Range, Hopkins R., Curdie's & Gellibrand Rivers, eastern Port Phillip where now virtually extinct, Tonimbuk, Waratah Bay, Wilson Prom., Newton's Ck, Tonghi plains & Tamboon Rd near Cann R., Wingan Inlet); all States except W.A.

—Leaves up to 1 ft. long; bracts <15, *not* seriate, entire, the lower empty ones *few*; capsule fragile, *dehiscing along the entire length* 2

2. Leaves pale, to 1 ft. long; culms to 3 ft. high; heads 3-5 mm. wide; bracts 6-12, usually with large *pale centres*; style *cleft half-way* to base, the 3 branches *slender*; anthers *very large*:

638. *X. gracilis* R. Br. *Prodr. Flor. Nov. Holl.* 256 (1810).

Illust.: Arber, *Bot. Gaz.* 74: t. 2 (1922).

Vern.: Slender Yellow-eye. *Distr.*: Almost co-extensive with *X. operculata* on swampy tracts of heaths in southern Victoria, but more scattered and less common (e.g. Glenelg R., Mt. Clay near Portland, eastern fringe of Port Phillip Bay where now practically extinct, Upper Beaconsfield, Tonimbuk, Stradbroke, Providence Ponds, Reedy Ck near Cann R., Genoa Gorge & Upper Genoa R., Maramingo Ck); also Tas., N.S.W.

—Leaves and culms *short* (<3" and <9", respectively), usually *reddish*; heads \pm 3 mm. wide; bracts 4, *concolorous*; style only *slightly cleft*, the stigmatic arms *short and broad*; anthers relatively *small*:

639. *X. juncea* R. Br. *Prodr. Flor. Nov. Holl.* 256 (1810).

Illust.: Nil.

Vern.: Dwarf Yellow-eye. *Distr.*: In Victoria known only from a swampy heath in the extreme east (at Maramingo Ck, 6 miles N.E. of Genoa and 4 miles from the New South Wales border); also N.S.W., Qd.

Family 48. ERIOCAULACEÆ

205. ERIOCAULON L. (1753)

All bracts of head \pm *obtuse*, the inner glabrous on back but with *ciliate* upper margins; female flowers with 6 narrowly *oblong-spathulate* perianth-segments (the outer 3 *dark* and sparingly ciliate at apex, the inner 3 white segments longer and *copiously fringed* toward tips); ovary almost *sessile*:

640. *E. scariosum* Sm. in Rees *Cyclopædia* 13: (1809), non R. Br. (1810) nec sens. Ewart *Flor. Vict.* 263 (1931).

Illust.: Nil.

Vern.: Common Pipewort. *Distr.*: Widespread in north-eastern Victoria where not uncommon on muddy ground against lowland swamps or at semi-permanent soakages (e.g. Ruffy, Gooram, Strathbogie, Euroa, Warby Range, Myrtleford, Beechworth, Upper Murray R., Benambra Ck), with an isolated occurrence in Gippsland (Prince's Highway near Fernbank); N.S.W., Qd, ? N. Cal.

[The description under "*E. scariosum* Sm." in Ewart's *Flor. Vict.* 263 (1931) applies to *E. scariosum* R. Br.—a North Australian coastal plant having 2-merous flowers—and was obviously derived from Bentham's *Flor. aust.* 7: 197 (1878) without examination of any Victorian specimens.]

Outer bracts obtuse to acute; inner bracts *narrow, acuminate*, entirely *glabrous* on margins; female flowers *devoid* of perianth-segments; ovary shortly but distinctly *pedicellate* (very rare north-western plant):

641. *E. australasicum* (F. Muell.) Koern. in *Linnæa* 27: 616 (1856).

Electrosperma australasicum F. Muell. in *Trans. phil. Soc. Vict.* 1: 24 (1855).

Illust.: Nil.

Vern.: Pipewort. *Distr.*: Extremely rare in Victoria, if still present, being known only by the type collection of Dec. 1853 ("wet places along the Murray towards junction of Murrumbidgee"); presumably also in N.S.W.

Family 49. *COMMELINACEÆ

206. *TRADESCANTIA L. (1753)

642. **T. fluminensis* Vell. *Flor. flum.* 140 (1825).

Illust.: Velloso, *Flor. flum.* (Icon.) 3: t. 152 (1835); Herter, *Flor. il. Uruguay* 1: fig. 790 (1943); Bailey, *Standard Cycl. Hort.* new ed., 3: fig. 3829-30 (1925); Fiebrig, *Rev. Jard. bot. Paraguay* 1: t. 12 (1921).

Vern.: Wandering Jew (Water Spiderwort). *Distr.*: Indigenous to South America (Cent. Brazil to Argentina); introduced into S. Afr., N.Z. (North Id), Qd, N.S.W. and Victoria where sometimes escaping from cultivation in green-houses or ferneries (e.g. Melbourne area at Dight's Falls on Yarra, stream banks at Belgrave, etc.).

Diagn.: Glabrous, trailing, shade-loving herb that roots readily from nodes and is very easily propagated vegetatively at any season; leaf-blades shining, narrowly ovate, almost sessile, with broad subcordate bases, 3-5 cm. long, 1-2 cm. wide, with 5-7 prominent veins, the sheath 5-10 mm. long, loose, \pm hyaline and ciliate at apex; flowers stalked, several together in a terminal cluster subtended by 2 unequal leaf-like bracts; calyx segments 3, green, ovate, 6-8 mm. long, \pm hairy along keels; petals 3, white, delicate, wide-spreading, \pm 10 mm. long, ovate to elliptic; stamens 6, the slender filaments bearing long white hairs from base, the anthers 0.5-1.0 mm. long; fruit a 3-locular capsule, normally with 6 seeds.

Family 50. *PONTEDERACEÆ

207. *EICHHORNIA Kunth (1843)

643. **E. crassipes* (Mart.) Solms-Laubach in Alph. DC. & C. DC. *Monogr. Phan.* 4: 527 (1883).

Pontederia crassipes Mart. *Nov. Gen. & Spec. Plant.* 1: 9, t. 4 (1823);

E. speciosa Kunth *Enum. Plant.* 4: 131 (1843).

Illust.: Martius (l.c.); Whittet, *Weeds* (N.S.W. Dep. Agric.) fig. 24 (1958); Everist, *Common Weeds Farm & Pasture* fig. 2 (1957); Meadly, *J. Dep. Agric. W. Aust.* ser. 3, 3: t. col. opp. 577 (1954); Cocks in Spafford, *Bull. Dep. Agric. S. Aust.* 345: Frontisp., col. (1939), as "*E. speciosa*"; Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: fig. 141 A (1940); Maiden, *Weeds N.S.W.* 35 (1920), as "*E. speciosa*"; Wauer in Ewart, *J. Dep. Agric. Vic.* 4: t. 6 opp. 688, col. (1906), also *Weeds . . . Vict.* t. opp. 60, col. (1909)—both as "*E. speciosa*"; *Agric. Gaz. N.S.W.* 10: t. opp. 1141 (1899), 11: t. opp. 446 (1900), 17: t. opp. 1221 (1906); Soutter, *Qd agric. J.* 1: tt. opp. 252 (1897); Pomeroy in Mason, *Flor. Marshes Calif.* fig. 167 (1957); Cherfils in Lecomte, *Flor. gén. Indo-Chine* 6: 820, 827 (1934); Herter, *Flor. il. Uruguay* 1: fig. 803 (1943); Bailey, *Standard Cycl. Hort.* new ed., 1: fig. 1384 (1925); Schönland in Engler & Prantl, *Natürl. Pflfam.* II 4: fig. 40 (1888).

Vern.: Water Hyacinth ("Lilac Devil"—Congo). *Distr.*: Indigenous to tropical S. America; introduced into N. Amer., Egypt, tropical & S. Afr., India, S.E. Asia, N. Cal., all mainland States of Australia but not a serious problem in W.A., S.A. or Victoria where there are small circumscribed infestations in the north-west (Kerang-Cohuna district, Boort and Lake Marmal), as well as reported occurrences at Echuca, Tatura, Horsham Park and Lilydale (on a dam). This highly noxious water-weed is sometimes cultivated in private ponds and aquaria for the sake of its decorative blooms and singular foliage.

Diagn.: Floating freshwater herb, with extensive plumose roots, propagating rapidly by stolons that radiate in all directions; leaves shining, with thick, rounded, somewhat undulate blades 1-3" long and wide (but often larger), strongly inflated at base where bulbous and air-filled, giving buoyancy to plant; flowering scape terminal, erect, 4-12" long with several green spathe-like bracts and 4-12 delicate bluish-mauve or lilac blooms; perianth inferior, wholly petaloid, with slightly curved tube to 1" long and 6 spreading elliptic segments of almost equal length, the inner whorl of 3 slightly broader, and uppermost petal with conspicuous yellow blotch toward its centre; stamens 6 with \pm hairy filaments, 3 exerted, 3 enclosed; anthers \pm 2 mm. long; fruit a many-seeded, 3-locular capsule.

Family 51. PHILYDRACEÆ

208. PHILYDRUM Banks ex J. Gärtner. (1788)

644. *P. lanuginosum* Banks ex J. Gärtner. *Fruct. & Semin. Plant.* 1: 62, t. 16 fig. 10 (1788).

Illust.: Gärtner (l.c.); Edwards in *Curtis's bot. Mag.* 20: t. 783, col. (1804); Williamson, *Vict. Nat.* 44: 243 fig. 1 (1928); Miller in Banks & Solander, *Ill. austr. Plant. Cook's Voy.* 3: t. 310 (1905); Hutchinson, *Fam. flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 410 (1959); Hutchinson in Ridley, *Flor. Malay Penins.* 4: fig. 201 (1924); Baillon, *Hist. Plant.* 13: fig. 160-163 (1894); Engler & Prantl, *Natürl. Pflfam.* II 4: fig. 41 (1888); Schnizlein, *Icon. Fam. nat. Regn. veg.* 1: t. 52, col. (1845).

Vern.: Woolly Waterlily. *Dist.*: Scattered through lowland Victoria in shallow freshwater swamps, but very localized and seldom observed (Upper Wimmera R. near Grampians, Kerang, Cheltenham where probably now extinct, near Fernbank, Lindenow South, Bairnsdale); N.S.W., Qd, N. Aust., W.A. (Kimberleys), ? N.G., Malaya, S. China, Burma.

Diagn.: Perennial herb with glabrous, linear, pointed leaves 6-18" long and 5-10 mm. wide; inflorescence a long, erect, simple or slightly branched, stout spike rising 2-3 ft., with leaves passing gradually into ovate-acuminate floral bracts (15-25 × 7-10 mm.) along the loosely white-woolly axis; flowers to 20 per spike (or more), bisexual, very zygomorphic, yellow, entirely petaloid, 4-partite in 2 series (upper and lower outer segments ovate, 10-12 × 8-10 mm., the inner lateral pair narrower and 3-5 mm. long); stamen solitary, with flattened filament and twisted anther 1-2 mm. long; style half as long as superior ovary, with capitate stigma; fruit a ± woolly 3-locular capsule with broad obtuse valves 7-10 mm. long; seeds very numerous, shining brown, ± 0.7 mm. long, subcylindric, but ± urceolate-coronate at each end, ornately twisted and papillose.

Family 52. JUNCACEÆ

Leaves always *glabrous*; capsule 3-locular, with *numerous seeds* 210. *Juncus*
Leaves ± *hairy* (at least on margins); capsule 1-locular, *3-seeded*

209. *Luzula*

209. *LUZULA* DC. in Lam. & DC. (1805)

645. *L. campestris* (L.) DC in Lam. & DC. *Flor. franc.* ed 3, 3: 158 (1805).

Juncus campestris L. *Spec. Plant.* 1: 329 (1753) pro parte.

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 256 (1943); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1080 (1931); Atkinson in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 911 (1940); Makino, *Ill. Flor. Jap.* 716-717 (1924); Buchenau, *Pflanzenreich* IV 36 (Heft 25): 87 fig. 52, 90 fig. 53, 91 fig. 54, 93 fig. 55 (1906)—var. *picta*, *bank-siana*, *congesta* and *frigida* respect.; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2851, col. (1930-31); Coste, *Flor. Franc.* 3: fig. 3742 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 57 fig. 1, col. (1909); Reichenbach, *Icon. Flor. germ.* 9: tt. 375, 376, col. (1847).

Vern.: Field Woodrush. *Dist.*: Frequent and widespread in cooler (usually shaded) parts of Victoria, from sea-level to the alps, but absent from Mallee and northern plains; all States, N.Z., and almost cosmopolitan.

Diagn.: Loosely tufted perennial to 1 ft. high, often with swollen stock and short-creeping stolons; leaves grass-like, flat, linear, 2-5 mm. broad, ciliate with long white hairs (especially toward base); stem slender, with 1-4 leaf-like bracts beneath the loose or congested panicle; flowers brown, disposed in clusters or globular heads on the unequal, filiform and almost umbellate branches; perianth subtended by white scarious bracteoles, the 6 acuminate segments equal and usually 2-3 mm. long; stamens 6; capsule slightly shorter than perianth, obovoid, 3-locular and 3-seeded; seed smooth, shiny, with prominent white basal appendage (or aril).

[A highly variable species (or perhaps "aggregate") of which many varieties have been described, some being now elevated to specific rank. In Victoria at least three subordinate taxa are discernible, viz.: var. *picta* (Less. & A. Rich., *ut sp.*) Hook f. *Handb. N.Z. Flor.* 1: 292 (1864), with stoloniferous habit, very slender stems and panicle-branches, and long-ciliate narrowish leaves; var. *flaccida* Buch.

in *Pflanzenreich* IV 36 (Heft 25): 92 (1906), with loosely-tufted habit, small pale heads, limp stems and very narrow (1-2 mm.), lax, almost glabrous leaves (chiefly a plant of shaded forest-land), and var. *australasica* (Steud., *ut sp.*) Buch. in *Öst. bot. Z.* 1898: 216 (1898) with rigid, loosely-ciliate foliage and very short congested (almost ovoid) inflorescence of dark flowers (a montane to high alpine plant). It is probable that genetical studies will necessitate the recognition of one or more Victorian populations as distinct species.]

210. JUNCUS L. (1753)

1. Plants *leafy*; blades of leaves either *flat* and channelled, or *septate* with \pm woody partitions; inflorescence *terminal* (but often with one or more elongated leaf-like bracts) 13
Plants *not leafy*; culms, leaf-blades (when present) and blades of main floral bracts all *similar and terete* (the context variously pithy, but *never* regularly septate); inflorescence *lateral* to a single erect bract 2
 2. Pith of culms *devoid* of longitudinal woody threads; leaf-blades *never present*; bracts hardly pungent; culms and main bracts rather weak [Section GENUINI] 4
Pith of culms (and leaf-blades) solid and traversed by *longitudinal woody threads*; main bracts and leaf-blade tough, *pungent* [Section THALASSICI] 3
 3. Inflorescence *loose, elongated*, the flowers in *small clusters*; capsule \pm 3 mm. long, completely *trilocular*, about *as long as* perianth (tall dingy rush of coastal marshes):
646. ^{KRAUSSII Hook. f.} *J. maritimus* Lam. in *Encycl. méth. (Bot.)* 3: 264 (1789).
Illust.: Hamilton, *Proc. Linn. Soc. N.S.W.* 44: t. 30 fig. 27 (1919); Herter, *Flor. il. Uruguay* 1: fig. 818 (1943); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2830, col. (1930-31); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1072 (1931); Buchenau, *Pflanzenreich* IV 36 (Heft 25): 153 fig. 78 m (1906); Reichenbach, *Icon. Flor. germ.* 9: t. 402, col. (1847).
Vern.: Sea Rush. *Dist.*: Frequent in saline and brackish marshes along the whole coast of Victoria; all States, N.Z., and almost throughout the world on temperate and subtropical coasts.
[Australian populations are referable to the var. *australiensis* Buch. in *Bot. Jb.* 12: 257 (1890), distinguished by its *longer* staminal filaments (3-4 times the length of anther), more *trigonus* capsules and shortly *caudate* seeds.]

—Inflorescence *congested*, the flowers in *large dense clusters*; capsule \pm 5 mm. long, *triseptate*, finally much *exceeding* the perianth (salt-loving rush, forming neat, \pm globular tussocks to 4 ft. high, the very prickly leaves and culms usually bluish-green):

647. **J. acutus* L. *Spec. Plant.* 1: 325 (1753).

Illust.: Bryant, *Wild Life* 11: 258 (1949); Reinholdt in Mason, *Flor. Marshes Calif.* fig. 169 (1957); Herter, *Flor. il. Uruguay* 1: fig. 817 (1943); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2830 b, col. (1930-31); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1073 (1931); Reichenbach, *Icon. Flor. germ.* 9: t. 401, col. (1847); Atkinson in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 865 (1940),

Vern.: Sharp Rush (Spiny Rush). *Distr.*: Native to the coasts of western and southern Europe, the Caucasus, Africa, California and S. America; introduced in N.Z., N.S.W., S.A., and Victoria where it occurs both on saline coastal flats and on silt deposits inland, especially after gold-mining operations (e.g. at Grampians, Mildura, Bendigo, Lake Cooper near Elmore, Rutherglen, Daylesford, Altona, Port Melbourne).

4. Semi-aquatic rush; culms stout, 6 ft. high or more; pith interrupted; inflorescences *unisexual*, *very large* (to 8" long) loose and diffuse; stamens 6, reduced to staminodes in female flowers (ovary obsolete in male flowers):

648. *J. ingens* N. A. Wakefield in *Vict. Nat.* 73: 211 (1957).

Illust.: Nil.

Vern.: Giant Rush. *Distr.*: North and eastern Victoria, along lagoons of the Murray River and its tributaries (Goulburn, Kiewa etc.), Rosedale, Bairnsdale and Brodribb River; also N.S.W.

[Sometimes attaining 15 ft. and apparently the largest species of *Juncus* in the world, as well as the only undoubtedly diœcious one.]

—Terrestrial rushes (but often in wet places); culms and inflorescences *shorter* than in the last; all the flowers *bisexual* 5

5. Inflorescence *very loose*, with about 20-60 rather remotely *separated*, *reddish flowers on capillary* and \pm curved branches; stamens 6; mature capsule \pm 3 mm. long, *much exceeding* the perianth; culms weak, slender, smooth, the basal sheaths \pm dark purplish; pith spongy and continuous (rarely slightly interrupted):

649. *J. pauciflorus* R. Br. *Prodr. Flor. Nov. Holl.* 259 (1810).

Illust.: Matthews & Glue, *N.Z. J. Agric.* 95: 21-22 (1957).

Vern.: Loose-flower Rush. *Distr.*: Moist (and usually shaded) forest and near-coastal areas from Portland to Mallacoota; all States, N.Z., N. Cal., China, Japan.

[The species apparently hybridizes occasionally with *J. australis*, resulting in taller, stronger plants with denser, many-flowered inflorescences and relatively shorter capsules. Victorian populations apparently all belong to the var. *gunnii* (Hook. f., *ut sp.*) Buch. in *Bot. Jb.* 12: 239 (1890), having 6 stamens and more deeply coloured flowers and basal sheaths than in the typical form.]

—Inflorescence not as above or stamens < 6 6

6. Panicle a *loose cluster* of several simple or branched, \pm straight *unilateral spikes* (each of *few to several flowers*), with a *similar cluster* terminating a bare elongated branch above it; culms few, from a short rhizome, usually \pm 1 mm. thick and 1-2 ft. high 12
Panicle *not* as above; flowers either normally some hundreds per inflorescence (except in depauperate plants) or in congested clusters 7
7. Stamens 3-4 (rarely more in occasional flowers) 9
Stamens 6 (rarely less in occasional flowers); pith spongy and *continuous*; basal sheaths large, *loose*, rather pale; culms usually stout 8

8. Inflorescence dense or loose, but flowers *not* in capitate clusters, always quite *pale*; capsules 3-4 mm. long, *ovoid*, usually *exceeding* the *subacute* perianth-segments; culm usually 3-6 ft. high, *slightly striated*:

650. *J. pallidus* R. Br. Prodr. Flor. Nov. Holl. 258 (1810).

Illust.: Black, *Flor. S. Austr.* ed. 2: fig. 255 (1943); Buchenau, *Pflanzenreich* IV 36 (Heft 25): 139 fig. 72 (1906).

Vern.: Pale Rush. *Distr.*: Abundant in lowland (and particularly near-coastal) areas throughout Victoria, except in the drier north-west; all States, N.Z.

[Occasional plants having 6 stamens and the spongy pith continuous, but otherwise with the general characters of *J. australis* (q.v.), appear to be hybrids between that species and *J. pallidus*.]

—Inflorescence with *bare*, \pm *divaricate* branches and *capitate* clusters of flowers (rarely reduced to a single cluster); flowers pale to deep *orange-red* (sometimes purplish); capsule *subglobular*, *not exceeding* the \pm *pungent* perianth-segments; culm *strongly striated*:

651. *J. vaginatus* R. Br. Prodr. Flor. Nov. Holl. 258 (1810).

Illust.: Nil.

Vern.: Clustered Rush. *Distr.*: Scattered through central and eastern Victoria, ascending to the alps (Creswick, Bairnsdale, Wulgulmerang, Cobboras Mts., Davey's High Plain near Mt. Gibbo, Bendoc etc.); N.S.W., Tas., ? W.A.

9. Inflorescence of one or more *congested* clusters of flowers, and usually with bare branches between the groups (if ever \pm loose, then flowers about 3 mm. long and pale to light orange in colour) 11

Inflorescence *large and loose*, with each flower separate (small and \pm dense only in depauperate forms); flowers 1-2 mm. long, either dark red or the inner 3 segments with very broad membranous wings; culms normally 1-3 ft. high; pith spongy 10

10. Culm *slightly striated*, the pith *continuous* (rarely slightly interrupted); inflorescence normally *reddish*; capsule usually *exceeding* the perianth:

652. *J. effusus* L. Spec. Plant. 1: 326 (1753).

Illust.: Reinholdt in Mason, *Flor. Marshes Calif.* fig. 172 (1957); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 56 fig. 1, col. (1908); Strudwick, *Further Ill. Brit. Plant.* fig. 367 (1930), excl. fig. D; Reichenbach, *Icon. Flor. germ.* 9: t. 413, col. (1847); Atkinson in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 857 (1940).

Vern.: Soft Rush. *Distr.*: Confined in Victoria to eastern districts where not uncommon (Upper Murray R., Bairnsdale area, Cann R. etc.); N.S.W., Qd, N.Z. and almost cosmopolitan.

—Culm *strongly striated*, the pith \pm *interrupted*; inflorescence *pale* (*yellowish*); capsule *not* or hardly exceeding the perianth:

653. *J. polyanthemus* Buch. in Bot. Jb. 21: 261 (1895).

Illust.: Matthews & Glue, *N.Z. J. Agric.* 95: 21-23 (1957).

Vern.: Tussock Rush. *Distr.*: Scattered through Victoria, except in the drier north-west; all States (except Tas. ?), N.Z.

11. Culms *often tall* and stout, *shiny, not* or hardly striated, the interrupted pith *corky* (rarely solid and continuous); uppermost basal sheaths usually 2-6" long, *standing away* from the culm and *broadly dilated* in the apical portion, *smooth*, shiny, chestnut-brown below and pale above; inflorescence usually large and compound (except in depauperate forms); inner perianth-segments with *stiff narrow wings*:

654. *J. australis* Hook. f. *Flor. Tasm.* 2: 66, t. 134 A, col. (1858).

J. vaginatus sens. Buch. in *Pflanzenreich* IV 36 (Heft 25): 141 (1906), non R. Br. (1810);

J. polyanthemos sens. Ewart *Flor. Vict.* 271 (1931) pro major. parte, non Buch. (1895) sens. strict.

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Austral Rush. *Distr.*: Abundant and widespread almost throughout Victoria (except in drier north-west) in wet and often shaded places; all States (except Qd ?), N.Z.

[Plants are sometimes found with features intermediate between those of *J. australis* and other species (e.g. *J. pauciflorus*, *J. pallidus*, *J. effusus* and *J. polyanthemos*); the plants concerned are possible hybrids, since they always occur in the immediate vicinity of the supposed parent species.]

—Culms *short* and slender (usually 6-18" high and about 1 mm. in diameter), *strongly striated*, the interrupted pith *spongy*; uppermost basal sheaths <2" long, *appressed, strongly striated*; flower-clusters small, *few or solitary*; inner perianth-segments *broadly winged*:

655. *J. filicaulis* Buch. in *Proc. Linn. Soc. N.S.W.* 28: 913 (1904).

Illust.: Nil.

Vern.: Thread Rush. *Distr.*: Scattered on damp ground almost throughout Victoria, chiefly in the lowlands (Lower Glenelg R., Mildura, Heathcote district, Lal Lal Falls, Queenscliff, Garvoc, Yarra R., Avon R., Perry R., Gelantipy etc.); N.S.W., S.A., W.A.

12. Upper part of greyish culm, branches of inflorescence and backs of perianth-segments *scabrous*; pith *continuous*; flowers \pm 4 mm. long:

656. *J. radula* Buch. *Krit. Verzeichn. Juncac.* 38 (1880).

Illust.: Nil.

Vern.: Hoary Rush (Scraper Rush). *Distr.*: Flats and wet depressions in many parts of Victoria, often in otherwise rather dry districts (e.g. Swan Hill, Bendigo, Goulburn Valley, Geelong district, Avon R., etc.); N.S.W.

—Culms and inflorescences *never scabrous*; pith somewhat *interrupted*; flowers \pm 3 mm. long:

657. *J. subsecundus* N. A. Wakefield in *Vict. Nat.* 73: 211 (1957).

Illust.: Nil.

Vern.: Finger Rush. *Distr.*: Scattered on flats and wet depressions almost throughout Victoria, often in drier districts (e.g. Dimboola, Moyston, Bendigo, Castlemaine, Creswick, Avon & Perry Rivers, etc.); N.S.W., Qd, S.A.

13. Leaves *hollow, terete or laterally compressed, transversely septate* [*Section SEPTATI*] 22
 Leaves *solid, dorsiventrally flattened (or channelled), not septate* 14
14. Leaf-blades very narrow, thick and channelled or thin and strongly incurved; wings of the basal sheaths *terminating abruptly* in a lobe or auricle [*Section POIOPHYLLII*] 19
 Leaf-blades all thin, the margins acute and *continuous* with wings of the basal sheaths [*Section GRAMINIFOLII*] 15
15. Culms several inches high (5-12"), arising from *long-creeping branched rhizomes*; flowers in a *single* (or rarely 2-3) dark *capitate cluster*; perianth-segments and capsules 5 mm. long or more; style-arms very *conspicuous at anthesis*, mauve and intricately fimbriate (alpine and subalpine rush):
658. *J. falcatus* E. Mey. *Synops. Luzul.* 34 (1823).
Illust.: Atkinson in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 875 (1940).
Vern.: Sickie-leaf Rush. *Distr.*: Restricted to bog and fen formations and hillside soaks in the eastern alps and sub-alps (e.g. Cobboras, Bogong & Dargo High Plains, Upper Delegate & Ingegoodbee Rivers, Bendoc); N.S.W., Tas., Japan, Aleutian Is, western N. America.
- Culms *tufted*; perianth-segments (at least the inner ones) and capsules 3 mm. long or less 16
16. Annual, usually <3" high; inflorescence a single *capitate cluster* (sometimes a second cluster above it); outer perianth-segments *acuminate, twice as long as* inner segments and capsule:
659. **J. capitatus* Weig. *Obsns bot.* 28, t. 2 fig. 5 (1772).
Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 250 (1943); Lee, *Wild Life* 13: 356 (1951); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1071 (1931); Herter, *Flor. il. Uruguay* 1: fig. 825 (1943); Poinsett in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2826, col. (1930-31); Scholl in Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 290 (1909).
Vern.: Capitate Rush. *Distr.*: Native to Europe and Africa (but rare in Britain), apparently introduced in Newfoundland, S. America, S.A. and Victoria where it is widespread as a weed in open pastures and on cultivated land (e.g. Kulkynne Forest, Dimboola, Grampians, Creswick, Kilmore, Melbourne area, Anglesea).
- Perennials; perianth-segments and capsule *subequal* in length 17
17. Alpine mat-plant about 1" high; flowers 2-3 in a single head *not exceeding* the leaves; seeds \pm 0.4 mm. long:
660. *J. antarcticus* Hook. f. *Flor. Antarct.* 1: 79, t. 46 (1844).
Illust.: Fitch in Hooker (*l.c.*).
Vern.: Cushion Rush. *Distr.*: Bogs and springs on the Bogong High Plains above 5500 ft. alt. (Mt. Nelson, Pretty Valley, source of Bundarra R.); also N.S.W. (alpine bogs on Mt. Kosciusko), N.Z., Campbell Id.
- Lowland plants; culms normally several inches high, *exceeding the leaves* and bearing *numerous* dark flowers 18
18. Plant *not* rhizomic; leaves *broad* (3-10 mm. wide), \pm *flat*; stamens 3:

661. *J. planifolius* R. Br. *Prodr. Flor. Nov. Holl.* 259 (1810).*Illustr.*: Buchenau, *Pflanzenreich* IV 36 (Heft 25): 250 fig. 117 (1906).*Vern.*: Broad-leaf Rush. *Distr.*: Widespread and frequent throughout cooler parts of Victoria; all States, N.Z., Chile.

[Reduced states of *J. planifolius* (e.g. from Dimboola-Horsham district) may be only 1' high with leaves about 1 mm. wide, and are then by no means easy to distinguish from the alpine *J. antarcticus*. The latter species, however, has leaves almost *terete* toward the apices, *not* minutely papillose (under the microscope) and seeds almost *twice as long* (0.4 mm.) as in *J. planifolius*.]

—Plant *rhizomic*; leaves narrow (\pm 2 mm. wide), *rolled or subulate*; stamens 6:

662. *J. caespiticius* E. Mey. in Lehm. *Plant. Preiss.* 2: 47 (1846).*Illustr.*: Black, *Flor. S. Aust.* ed. 2: fig. 252 (1943).*Vern.*: Grassy Rush (Tufted Rush). *Distr.*: Scattered through cooler parts of Victoria on marshy ground and gully soaks (Lower Glenelg R., Portland, Hawkesdale, Lancefield, Frankston, Arthur's Seat, Mt. Typo near Whitfield, Snowy R., Ram Head, Gabo Id etc.); all States except Qd, N.Z.

19. Annual 2-8" high, with shining \pm resinous leaves; panicle normally branched and occupying *most of the plant*; flowers pale green, *separate* or rarely in small clusters:

663. *J. bufonius* L. *Spec. Plant.* 1: 328 (1753).

Illustr.: Black, *Flor. S. Aust.* ed. 2: fig. 251 (1943); Reinholdt in Mason, *Flor. Marshes Calif.* fig. 174 (1957); Herter, *Flor. il. Uruguay* 1: fig. 809 (1943); Poinot in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2842, col. (1930-1931); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 56 fig. 5, col. (1908); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1069 (1931); Atkinson in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 866 (1940); Reichenbach, *Icon. Flor. germ.* 9: t. 395, col. (1847).

Vern.: Toad Rush. *Distr.*: Widespread and abundant almost throughout Victoria, often a weed in gardens; all States, N.Z. and practically cosmopolitan. [The species is polymorphic and a number of varieties has been described, the minute var. *pumilio* Griseb. in *Abh. Ges. Wiss. Göttingen* 24: 316 (1879) being in Victoria.]

—Perennials

20. Wings of leaf-bases produced into auricles *several times* as long as wide; flowers 3-4 mm. long, in a loose panicle much *exceeded by* 1 or 2 leaf-like bracts:

664. **J. tenuis* Willd. *Spec. Plant.* 2: 214 (1799).

Illustr.: Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1067 (1931); Atkinson in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 873 (1940); Herter, *Flor. il. Uruguay* 1: fig. 810 (1943); Scholl in Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 288 (1909); Reichenbach, *Icon. Flor. germ.* 9: t. 398, col. (1847).

Vern.: Slender Rush. *Distr.*: Native to N. & S. America; naturalized in Europe (including Britain), N.S.W., S.A., and collected at Tawonga, N.E. Victoria in Apr. 1941.

[The closely related, or perhaps not specifically distinct, *J. macer* S. F. Gray, is recorded as an occasional weed on damp pastures and waste places in both Islands of New Zealand.]

—Auricles on leaves *not* longer than wide; floral bracts *not* or hardly exceeding the inflorescence; flowers \pm 5 mm. long 21

21. Leaf-lamina *thin*, the margins involute; flowers *separate* in short, somewhat secund racemes; perianth-segments and capsule *subequal* in length (culms up to 6" high, arising at intervals from a stout creeping rhizome):

665. *J. revolutus* R. Br. *Prodr. Flor. Nov. Holl.* 259 (1810).

Illust.: Buchenau, *Pflanzenreich* IV 36 (Heft 25): 114 fig. 61 (1906), as "*J. brownii*"; Mueller, *Key Syst. Vict. Plants* 2: fig. 123 (1885), as "*J. brownii*".

Vern.: Creeping Rush. *Distr.*: Scattered on damp saline sandy ground near the sea, and uncommon in Victoria (Altona, mouth of Yarra R., Tooradin, mouth of Snowy R.); N.S.W., Tas., S.A. (extreme south-east).

—Leaf-lamina *thick*, *subterete*; flowers divaricate, in *small, often arched clusters*; outer perianth-segments *much longer than* the inner segments and capsule:

666. *J. ~~plebeius~~ R. Br. *Prodr. Flor. Nov. Holl.* 259 (1810).*
HOMALOCAULIS F. Muell. ex Benth.

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 253 (1943); Buchenau, *Pflanzenreich* IV 36 (Heft 25): 116 fig. 62 (1906); Ewart, *Plant. indig. Vict.* t. 86 opp. 23 (1910), as "*J. homalocaulis*".

Vern.: Wiry Rush. *Distr.*: Widespread on damp ground almost throughout Victoria, except in the alps and Far North-west; all States, N.Z.

22. Leaves *terete* or almost so, *unitubular* with complete transverse septation 24

Leaves *laterally compressed*, longitudinally *multitubular*, the individual tubes transversely septate 23

23. Usually 1 ft. high or more; leaves *strap-like*, with *several tubes*; inflorescence with *long* branches and *distant* flower-clusters:

667. *J. prismatocarpus* R. Br. *Prodr. Flor. Nov. Holl.* 259 (1810).

Illust.: Buchenau, *Pflanzenreich* IV 36 (Heft 25): 181 fig. 89 (1906).

Vern.: Branching Rush. *Distr.*: Widespread in wet places over southern and eastern Victoria, but rather uncommon (Hawkesdale, Melbourne district, Upper Murray, Delegate, Rocky, Cann & Genoa Rivers); all States except W.A., N.Z., Philippines, Japan, China, India, Ceylon.

[Asiatic populations are mostly referable to the var. *leschenaultii* (Gay) Buch., with fewer flowers in smaller clusters (6-9 mm. wide).]

—Usually dwarf, <1 ft. high; leaves *setaceous*, with *only 2 tubes*; inflorescence simple or branched, the flower-clusters sometimes proliferous (stems usually \pm swollen at the base):

668. **J. bulbosus* L. *Spec. Plant.* 1: 327 (1753).

Illust.: Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2840, col. (1930-31); Strudwick, *Further Ill. Brit. Plant.* fig. 370 (1930); Reichenbach, *Icon. Flor. germ.* 9: t. 397, col. (1847), as "*J. supinus*".

Vern.: Bulbous Rush. *Distr.*: Europe, N. Afr., Madeira and Azores; naturalized in N.Z. (Westport), and collected at Arthur's Seat, Mornington Peninsula, Vic., Nov. 1950. [A collection from the Tyers R. at Gould (Nov. 1957) is close to *J. bulbosus*, but has 4-6 stamens instead of the normal 3.]

24. Rhizomes *slender and much-branched*, the plants forming low mounds or cushions only a few inches high; inflorescence *no longer than leaves*, consisting of a few (<6) small clusters of pale flowers (alpine or montane rush of eastern highlands):

669. *J. pusillus* Buch. in *Abh. naturw. Ver. Bremen* 6: 395 (1879) in adnot.

Illust.: Fitch in Hooker f., *Flor. Tasm.* 2: t. 134 B, col. (1858), as "*J. capillaceus*"; Drygalski, *Dtsch. Südpol.-Exped. 1901-03*, 8 (Bot.): 24, fig. 13-16 (1911).

Vern.: Alpine Joint-leaf Rush. *Distr.*: Bog and fen formations of alpine and sub-alpine terrain, widespread in eastern highlands of Victoria (Blacks' Spur, Baw Baws, Ruffy near Omeo, Bogong High Plains, Cobboras, Nunniong Plateau, Upper Delegate R., Lower Bendoc); Tas., N.S.W., Qd (?), N.Z., Kerguelen & Crozet Is.

—Rhizomes *stout or lacking*; plants normally several inches high, *not* forming low mounds or cushions; inflorescences much *exceeding* the leaves and with *many* flowers (usually in >6 clusters) 25

25. Mature capsule tapering into an *acute beak*, conspicuously *longer than* perianth 27

Mature capsule *obtuse*, but shortly mucronate, *not* or hardly exceeding the perianth (culms usually 1-3 ft. high) 26

26. Plant *tufted*; inflorescence with 4-8 clusters, each of 10-20 *pale, greenish* flowers 4-4.5 mm. long:

670. *J. holoschænus* R. Br. *Prodr. Flor. Nov. Holl.* 259 (1810).

Illust.: Nil.

Vern.: Joint-leaf Rush. *Distr.*: Abundant in wet places almost throughout Victoria (excepting the Far North-west); all States except Qd (?), N.Z.

—Plant *rhizomic and extensively creeping*; inflorescence with few to many clusters, each of 4-8 dark *chestnut-brown to blackish* flowers 3-4 mm. long:

671. **J. articulatus* L. *Spec. Plant.* 1: 327 (1753).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 254 (1943); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1064 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 11: fig. 2838 & 2838 d, col. (1930-31); Reinholdt in Mason, *Flor. Marshes Calif.* fig. 178 (1957); Atkinson in Abrams, *Ill. Flor. Pacific States* 1, ed. 2: fig. 886 (1940); Reichenbach, *Icon. Flor. germ.* 9: t. 405, col. (1847), as "*J. lamprocarpus*"; Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 56 fig. 4, col. (1908), as "*J. lamprocarpus*".

Vern.: Jointed Rush. *Distr.*: Native to Eurasia, N. Afr., N. Amer. on wet acidic ground and in marshes; introduced in N.Z., N.S.W., S.A. and Victoria where now frequent in or near freshwater in many districts (e.g. Lower Glenelg R., Timboon, Creswick, Melbourne area, Goulburn Valley, Wangaratta, Mt. St. Bernard, Warragul).

27. Plant with *wide-creeping rhizomes*; culms usually 1-3 ft. high; inflorescence *much* and diffusely branched; perianth-segments 3-3.5 mm. long; capsule *chestnut-brown to purplish*:

672. **J. acutiflorus* Ehrh. *Beitr. Naturk.* 6: 83 (1791).

Illustr.: Strudwick, *Further Ill. Brit. Plant.* fig. 368 (1930), as "*J. sylvaticus*"; Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 297 (1909); Reichenbach, *Icon. Flor. germ.* 9: t. 406, col. (1847).

Vern.: Sharp-flower Rush. *Distr.*: Native to W., S. and Central Europe and eastern N. Amer.; introduced in N.Z., N.S.W. (?) and Victoria where now naturalized, but scattered, in wet places of eastern districts (Cobram, Beechworth, Koetong, Mt. Buffalo, Strath Ck near Euroa, Dandenongs, Baw Baws, Orbost).

—Plant tufted; culms usually <1 ft. high; inflorescence *sparingly* branched; perianth-segments 4-4.5 mm. long; capsule \pm *ferruginous* (light reddish-brown):

673. *J. lockei* Buch. in *Bot. Jb.* 12: 358 (1890).

Illustr.: Buchenau, *Pflanzenreich* IV 36 (Heft 25): 208 fig. 101 (1906).

Vern.: Slender Joint-leaf Rush. *Distr.*: Scattered in swampy situations through eastern Victoria, rare in the west, absent from Mallee and high alps (Dimboola, Campaspe R., Dandenong Range, Benambra, Wombargo Range, Upper Snowy R., Lower Bendoc, Goongerah); N.S.W., Qd.

Family 53. CALECTASIACEÆ

211. CALECTASIA R. Br. (1810)

674. *C. cyanea* R. Br. *Prodr. Flor. Nov. Holl.* 264 (1810).

Illustr.: Fitch in *Curtis's bot. Mag.* 67: t. 3834, col. (1840); Speck in Blackall, *How to Know W. Aust. Wildflowers* 1: t. 1, col., opp. 64 (1954); Black, *Flor. S. Aust.* ed. 2: fig. 275 (1943); Nicholls, *Wild Life* 10: 160, 162 (1948); Reeves, *Wild Life* 1: 21 (Oct. 1939); Williamson, *Vict. Nat.* 45: 139 fig. 3 (1928); Dickins in *Pescott, Native Flowers Vict.*: frontisp., col. (1914); Bauer in Engler, *Natürl. Pflfam.* ed. 2, 15a: fig. 123 (1930), also ed. 1, II 5: fig. 36 (1888); Bauer in Schnizlein, *Icon. Fam. nat. Regn. veg.* 1: t. 51 c fig. 17-24 (1845); Bauer in Flinders, *Voy. Terra Austr.* Append. III (Bot.): t. 9 (1814).

Vern.: Blue Tinsel-lily. *Distr.*: Scattered on sandy heaths in far western and south-western Victoria, but uncommon (Little Desert, Black Range, Grampians, Wilkin Parish on Lower Glenelg R., Mt. Clay Forest N.E. of Portland); also S.A. (Far South-east), W.A.

Diagn.: Somewhat pubescent, rigid, ericoid shrub 1-2 ft. high; branches tough, \pm wiry, covered with overlapping, appressed, straw-coloured leaf-sheaths; leaves crowded, erect, linear-subulate, \pm pungent, 8-20 mm. long, \pm 0.5 mm. wide; flowers solitary at ends of shorter branches, spectacular, blue to rich

purple, with bright metallic sheen; perianth-segments lanceolate, 10-15 mm. long, widely spreading, glabrous, rigid, persistent, very dry and scarious, united below in a narrow pubescent tube (7-12 mm. long) that is enveloped by several erect, paler blue bracts; anthers 6, golden, erect, linear, \pm 5 mm. long, on shorter filaments attached to bases of lobes; style simple, filiform, exserted beyond anthers; ovary narrow, 1-locular, with 3 erect ovules; fruit indehiscent, 1-seeded, fusiform, \pm 5 mm. long.

Family 54. LILIACEÆ

1. Leaves many, densely tufted, 1-4 ft. long, \pm *angular* in section, tough, wire-like, narrow-linear to filiform; flowers extremely numerous, whitish, in hard *dense cylindrical spikes*, bisexual, the outer 3 perianth-segments dry, stiff and *scale-like* 212. *Xanthorrhæa*
 Leaves *thick, fleshy*, broad, edged with conspicuous horny (sometimes prickly) *teeth*; flowers *red, cylindrical*, in dense terminal racemes or panicles **Aloë* (p. 320)
 Leaves *reduced to scales*, in the axils of which arise filiform or ovate and leaf-like cladodes; flowers small, greenish-white, axillary, on drooping pedicels and usually isolated (fruit a red or black berry)
 231. **Asparagus*
 Leaves *not* at once long, wiry and angular, nor fleshy and toothed, if ever reduced to scales then the fruit a capsule; flowers never both scarious *and* bisexual, nor bright red and racemose 2
2. Glabrous jungle *climbers*; leaves *cauline, relatively broad*; flowers rather small, whitish; fruit an orange, red or black berry 24
 Plants either *never* climbing or, if so, the leaves all radical; if fruit a berry, then either bluish *or* the foliage and floral stem silky-hairy 3
3. Flowers bisexual 5
 Flowers *unisexual*; style 3-cleft 4
4. Leaves numerous, *hard*, stiff, *narrow-linear*, chiefly basal, often 2-toothed at apex; flowers usually small, *numerous*, in panicles or dense clusters, often yellowish; fruit capsular (tough, rhizomic, rush-like perennials) 213. *Lomandra*
 Leaves numerous, tufted, *relatively broad*, flat and tough, at least the lower parts beset with *silvery*, silky (almost scaly) *hairs*; flowers in racemes or panicles with erect branches; fruit a red or orange berry (rhizomic alpine or montane perennials) 226. *Astelia*
 Leaves 2-4, *soft, flaccid, stem-clasping*; *glabrous*; flowers *few* (<10), in a short open spike, usually white with a purplish ring toward base of segments; fruit capsular (small renascent herb with bulbous rootstock) 232. *Anguillaria*
5. Style *undivided*; stigma *entire* (rarely \pm 3-lobed, and then on a slender style) 8
 Style 3-branched from base (or short, with long separate stigmas) 6
6. Leaves perennial, *silver-hairy* on lower parts; flowers greenish, in panicle or racemes; fruit a red or orange berry 226. *Astelia*
 Leaves usually annual, *glabrous*; flowers neither paniculate *nor* racemose; fruit, if a berry, not red or yellow 7

7. Flowers several in a long-pedunculate *umbel*, white or externally flushed with pink (but *not* ringed); fruit an *acutely* trigonous capsule 233. *Burchardia*
 Flowers few in a loose terminal *spike*, whitish and \pm *ringed with purple*; fruit an *obtusely* trigonous capsule 232. *Anguillaria*
 Flowers single (rarely 2 together) and *pendulous* from the upper axils of *distichous cauline leaves*, white; fruit a blue or purplish (rarely white) berry 227. *Drymophila*
 Flower *solitary and terminal* (rarely 2 together), mauve; fruit a globular, almost fleshy capsule (low rhizomic plant of far East Gippsland, the ovate-lanceolate leaves 1-2" long) 230. *Schelhammera*
8. Flowers white, creamy, pink, blue or purple (*never* distinctly yellow) 10
 Flowers *bright yellow*, \pm *twisted* spirally in withering; filaments of 3 or all stamens *bearded* below the anthers 9
9. Leaves \pm fleshy and *onion-like*; flowers on an erect *fleshy raceme*; fruit a several-seeded *capsule* 221. *Bulbine*
 Leaves few, *grass-like*, soon withering; flowers in *umbel-like clusters* on an open *wiry panicle*; fruit divided to the base into 3 or fewer 1-seeded *nutlets* 222. *Tricoryne*
10. Flowers in *open*, usually racemose inflorescences (if ever congested, then the rootstock a bulb) 13
 Flowers in *dense* \pm globular heads or umbels (rhizomic or tufted, but *never* bulbous, perennials) 11
11. Scape 1-2 ft. high, with terminal umbel of numerous, *pedicellate*, *mauve* or rosy-pink flowers; stamens 3 (East Gippsland plant) 225. *Sowerbaea*
 Scape <1 ft. high; flowers *sessile* or nearly so, *white* or pale pink; stamens 6 (leaves < 4 cm. long, \pm subulate, mucronate or pungent-pointed) 12
12. Heads with *short*, *scarious*, *fimbriate* bracts; perianth-segments *free* (roots wiry, sometimes aerial) 223. *Laxmannia*
 Heads with involucre of *long-pointed*, sharp, entire bracts; perianth-segments white, linear, *united* below in a narrow tube (very rare Grampians plant) 224. *Borya*
13. Flowers *blue*, *paniculate*, with recurved pedicels; filaments glabrous, yellow, *thickened* beneath the anthers; fruit a *blue or purple berry* (leaves tough, \pm keeled, often scabrid on margins and midrib) 228. *Dianella*
 Flowers *not* as above; fruit a *capsule* 14
14. Staminal filaments *glabrous* 16
 Staminal filaments *pubescent* or each with a *tuft of woolly hairs* beneath the anther (readily discernible in the widely opening flowers); perianth *not* twisted after anthesis 15
15. Flowers purple or mauve-and-white, in loose *racemes* or *panicles*; perianth-segments up to 7 mm. long; seeds *angular* 217. *Arthropodium*
 Flowers clear blue or creamy-white (rarely pale yellow), in dichotomous *cymes* or umbel-like clusters; perianth-segments 8-14 mm. long; seeds *flat* 229. *Stypandra*

16. Flower *solitary* and \pm *sessile* within the tuft of grass-like leaves, relatively large, pale bluish; anthers all \pm *equal* (rhizomic, mat-forming perennial of damp alpine flats) 216. *Herpolirion*
 Flowers *racemose* or *paniculate*, violet or purplish, *twisted* after anthesis, the 3 petals with *long-fringed margins*; 3 anthers usually much *longer than* others (rhizomic or tuberous-rooted plants with radical grass-like leaves—often absent at flowering time) 219. *Thysanotus*
 Flowers neither solitary *nor* with fringed segments (but petals sometimes crinkled or denticulate) 17
17. Rootstock a *tunicate bulb*; both leaves and raceme \pm *fleshy*; capsule smooth (escaped garden plants) 22
 Rootstock a short *rhizome* or *tuft* of fibrous roots; if leaves fleshy and inflorescence a raceme, then capsule wrinkled and anthers \pm *versatile* 18
18. Perianth *spirally twisted* after flowering 21
 Perianth *not* at length spirally twisted 19
19. Leaves hollow, *cylindrical*, fleshy and *onion-like*; flowers pink or white; anthers *dorsifixed*; capsule transversely wrinkled 228. **Asphodelus*
 Leaves *flat*, grass-like; anthers *basifixed*, capsule almost *smooth* 20
20. Perianth *mauve*, the 2 whorls *dissimilar*; anthers with short papillose basal appendages; seeds 9-12 218. *Dichopogon*
 Perianth *white* or *greenish*, the 2 whorls \pm *similar*; anthers without appendages; stem 6" long or more, much *branched*; seeds numerous
**Anthericum* (p. 309)
 As for the last, but stem <6" long (often 1-2") and seeds up to 6 per capsule (rare, very slender alpine plant) 215. *Casia*
21. Flowers racemose or paniculate, white or pale to dark blue, usually numerous, the segments rather *narrow*; seeds up to 6 per capsule (usually 1-3) 215. *Casia*
 Flowers few, in a *corymb* or very wide panicle (seldom >4" high), bright blue, the wide-spreading segments *broadly oblong*; seeds >6 per capsule (which has 3 prominent, *laterally compressed lobes*) 214. *Chamæscilla*
22. Perianth dark blue, *urceolate-globose*, the segments *united* in a tube for the greater part; leaves usually limp, very narrow (flowers strongly fragrant) **Muscari* (p. 320)
 Perianth *not* urn-shaped, the segments *free* almost to base 23
23. Flowers *bell-shaped*, \pm *nodding*, usually blue, the segments with *prominent midrib* **Endymion* (p. 321)
 Flowers *not* bell-shaped *nor* nodding, white or greenish, the segments *obscurely nerved* **Ornithogalum* (p. 321)
24. Plants \pm *prickly*; leaves usually \pm *opposite*, *broadly elliptic*, with bold *reticulate venation*; anthers apparently 1-chambered; seeds 1-2 (rarely 3) per berry 26
 Plants *without* prickles; leaves *alternate*, rather narrow, *not* reticulate; anthers 2-chambered; seeds 3-12 per berry 25
25. Leaves mostly *linear*; inner perianth-segments *entire*; staminal filaments hardly flattened; berry *black* 234. *Geitonoplesium*

Leaves *narrow-ovate* to lanceolate; inner perianth-segments *fringed*; staminal filaments *flattened* and \pm united below; berry orange, \pm 1 cm. wide

235. *Eustrephus*

26. Tendrils *absent*; flowers *bisexual*, in *racemes*; berry dark red

236. *Ripogonum*

Tendrils *present* on petioles; flowers *unisexual*, in condensed cymes; berry black

237. *Smilax*

[Except for the first two and last two tribes, which J. Hutchinson assigns to three separate families (*Xanthorrhæaceæ*, *Philesiaceæ* and *Smilacaceæ*), the remaining tribes in the present arrangement conform to the order which he adopted in *Families of Flowering Plants* ed. 2, 2 (*Monocotyledons*): 592-612 (1959). Several tribal names used by Hutchinson are antedated by others defined in the works of Endlicher (1836), Kunth (1843), Baker (1873) and Bentham (1878); the latter are here reinstated, with the former indicated as synonyms (within brackets).]

Tribe XANTHORRHÆÆ

212. XANTHORRHÆA Sm. (1798)

1. Butt subterranean, a few inches thick; leaves 1-2 ft. long, triangular in section; spike 3-9" long, 1-2" thick, on a slender and sometimes flexuose scape 1-3 ft. high:

675. *X. minor* R. Br. *Prodr. Flor. Nov. Holl.* 288 (1810).

Illust.: Fitch in *Curtis's bot. Mag.* 103: t. 6297, col. (1877); Beuhne in *Honey Flor. Vict.* ed. 5: fig. 70 (1949), also *J. Dep. Agric. Vict.* 15: 115 (1917); Lee, *Wild Life* 8: 394 (1946); Williamson, *Vict. Nat.* 45: 38 fig. 2 (1928).

Vern.: Small Grass-tree (Bayonet Grass, Snake-charmers). *Distr.*: Except for the Mallee, northern plains, basalt areas and north-east, abundant throughout lowland Victoria on poor, chiefly sandy soils (e.g. in districts as widely dispersed as Lower Glenelg R., Apsley, Black & Dundas Ranges, Mt. Cole, St. Arnaud, Ballarat-Creswick region, Otways, Dandenongs, Kinglake, Yea, Tallarook, heaths of eastern Port Phillip, Arthur's Seat, French & Quail Is, Tonimbuk, Erica, Waratah Bay, Sunday Id, Tarra R., Deadcock Ck and many coastal tracts of East Gippsland); Tas., N.S.W., Qd.

—Butt massive, many inches thick; leaves very numerous, usually >3 ft. long; spike >1 ft. long, on stout erect scape >2 cm. thick

2. Plant widespread, usually developing a stout trunk (to 6 ft. high); leaves unequally 4-angled in section, the resinous exudation from their bases reddish-brown, aromatic; apices of bracts and sepals not pubescent:

676. *X. australis* R. Br. *Prodr. Flor. Nov. Holl.* 288 (1810).

Illust.: Beuhne in *Honey Flor. Vict.* ed. 5: fig. 69 (1949), also *J. Dep. Agric. Vict.* 15: 113 (1917); Nicholls & Leithhead, *Wild Life* 5: 303 (1943); Rodgers, *Wild Life* 1: 10 (Oct. 1939); Williamson, *Vict. Nat.* 45: 38 fig. 1 (1928); Kerr in Ewart, *Handb. For. Trees* t. 11 (1925); Dickins in Pescott, *Native Flowers Vict.* t. opp. 90 (1914).

Vern.: Austral Grass-tree. *Distr.*: Widespread through Victoria and often abundant on poor sandy heaths or rocky hillsides, except in the Far North-west, northern plains, basalt areas and alps, increasing and replacing ground flora in certain districts subject to repeated bush-fires (e.g. Big & Little Deserts, Grampians, Black Range, Poolaigelo, Casterton, Lower Glenelg R., Ballarat, Brisbane Range, Otways, Torquay, Arthur's Seat, Tonimbuk, Kinglake Nat. Park, Mt. Charlie near Macedon, Graytown, Broadford, Rushworth, Warby Range, Wilson Prom., Buchan, Suggan Buggan, Mt. Kaye, Upper Genoa R., Howe Range); N.S.W., Tas., S.A. (Far South-east).

—Plant of East Gippsland, always trunkless; leaves *3-angled* in section the resinous exudation from their bases *yellowish*; apices of bracts and sepals *pubescent*:

677. *X. hastilis* R. Br. *Prodr. Flor. Nov. Holl.* 288 (1810).

Illust.: Fitch in *Curtis's bot. Mag.* 79: t. 4722, col. (1853); Williamson, *Vict. Nat.* 45: 38 fig. 3 (1928); Kerr in Ewart, *Handb. For. Trees* t. 12 (1925); Fitch in Engler, *Natürl. PflFam.* ed. 2, 15a: fig. 121 (1930), also ed. 1, II 5: fig. 35 (1888); Hutchinson, *Fam. Flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 401 (1959); Miller in Banks & Soland., *Ill. aust. Plant. Cook's Voy.* 3: t. 315 (1905); Schnizlein, *Icon. Fam. nat. Regn. veg.* 1: t. 55d fig. 19-25, col. (1845).

Vern.: Spear Grass-tree. *Distr.*: A frequent and dominant component of Victorian coastal heaths, known as "grass-tree plains", east from Marlo in East Gippsland (e.g. at Newton's Ck, Mackenzie R., Wingan Inlet, Mallacoota, Howe Range); also N.S.W., Qd.

Tribe XEROTEÆ

213. LOMANDRA Labill. (1805)

MALE PLANTS

1. Flowers grouped (4-many) in dense *clusters or heads* 5
Flowers *scattered* (rarely 2-3 close together) in a loose panicle, raceme or simple spike. 2
2. Inner 3 perianth-segments bright *yellow*, tardily spreading, much *thicker and larger* than the 3 \pm scarious, purplish outer segments 4
Perianth-segments *all similar*, loosely spreading, rather thin and pale 3
3. Panicle-branches *smooth*; flower (including slender pedicel) 7-12 mm. long, *whitish*, \pm hyaline, distinctly *fragrant*, subtended by a hyaline acuminate bract 4-7 mm. long; segments *lanceolate*, free (leaves flat, 1.5-5 mm. wide):

678. *L. effusa* (Lindl.) Ewart in *Proc. roy. Soc. Vict.* new ser. 28: 219 (1916).
Xerotes effusa Lindl. in Mitch. *Three Exped. E. Aust.* 2: 101 (1838).

Illust.: Williamson, *Vict. Nat.* 45: 34 fig. 6 (1928).

Vern.: Scented Mat-rush. *Distr.*: Widespread on Mallee sand-hills from Mt. Arapiles to the Far North-west, where occasional, but infrequent where impinging on sclerophyll forests of central-western Victoria (Northern Grampians, Dimboola, Big & Little Deserts, near Lake Hindmarsh, Kulkyn Nat. Forest, Benetook, Swan Hill, Boort, Wycheproof, Lake Buloke, Bealiba), with an isolated record for Portland; N.S.W., Qd, S.A., W.A.

—Panicle-branches \pm *scabrid*; flower (with pedicel) 2-5 mm. long, *greenish* or streaked, almost odourless, the subtending bract minute (< 2 mm.); segments obtusely *ovate* (leaves often filiform or terete):

679. *L. micrantha* (Endl.) Ewart in *Proc. roy. Soc. Vict.* new ser. 28: 219 (1916).
Xerotes micrantha Endl. in *Lehm. Plant. Preiss* 2: 49 (1846).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 262 (1943); Williamson, *Vict. Nat.* 45: 34 fig. 8 (1928).

Vern.: Small-flower Mat-rush. *Distr.*: Excepting N.W. Mallee and northern plains, widespread through western Victoria where locally frequent on heaths (e.g. Lower Glenelg R., Black Range, Grampians, Stawell, Dimboola, fringes of Little Desert, Wyperfeld Nat. Park, Anglesea, Torquay), but now rare in forest (Goulburn R. near Seymour) or on grassland (Keilor basalt plains near Sunshine); N.S.W., S.A., W.A.

[The var. *sororia* (F. Muell. ex Benth., ut *Xerotes micrantha* var.) H. B. Williamson in *Vict. Nat.* 45: 37 (1928) differs manifestly from the typical form in having longer (> 1 ft.), flatter and *much broader* leaves (3-6 mm. wide); it is known only by a few collections from the Victorian alps (on Mts. Wellington and Skene), and may eventually prove to be specifically distinct.]

4. Inflorescence a loose *panicle* of numerous, fine, *scabrid branches*; flowers on pedicels 1-3 mm. long; leaves usually flat and then 2-5 mm. broad (widespread, extremely variable plant):

680. *L. filiformis* (Thunb.) Britten in Banks & Soland. *Ill. aust. Plant. Cook's Voy.* 3: 95, t. 314 (1905).

Dracæna filiformis Thunb. *Dracæna* 4 fig. 1 (1808).

Illust.: Thunberg (*l.c.*); Cleveley in Banks & Solander (*l.c.*); Williamson, *Vict. Nat.* 48: 34 fig. 9 (1928); Sulman, *Aust. Wild Flowers* ser. 2: t. 52 (1913), as "*Arthopodium paniculatum*".

Vern.: Wattle Mat-rush. *Distr.*: Except for the northern plains, Mallee and grassland formations, widespread and frequent throughout Victoria, from sea-level to the alps (e.g. in such dispersed localities as Lower Glenelg R., Portland, Hawkesdale, Grampians, Mt. Cole, Creswick, Whipstick Scrub near Bendigo, Brisbane Range, Torquay, Arthur's Seat, Dandenongs, Tallarook, Rushworth, Chiltern, Mt. Buffalo, Barry Mts., Mt. Feathertop, Limestone Ck, Upper Murray R., Dargo, Sunday Id in Corner Inlet, Howqua R., Mt. Drummer).

—Inflorescence of a single, erect, *smooth* spike, or several spikes in a narrow panicle; flowers *sessile*; leaves up to 1 mm. broad, often involute and terete (plant of far western Victoria):

681. *L. sororia* (F. Muell. ex Benth.) Ewart in *Proc. roy. Soc. Vict.* new ser. 28: 219 (1916).

Xerotes sororia F. Muell. ex Benth. *Flor. aust.* 7: 100 (1878);

L. caespitosa sens. J. M. Black *Flor. S. Aust.* ed. 2: 189 (1943), *non strict.* (Benth.) Ewart (1916).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 266 (1943), as "*L. caespitosa*"; Williamson, *Vict. Nat.* 45: 34 fig. 2 (1928).

Vern.: Small Mat-rush. *Distr.*: Restricted in Victoria to drier heaths and sandy woodlands of the far west, where widespread and locally common (Portland district, Dundas Range, Black Range, Grampians, Little Desert); also S.A., W.A.

[*Xerotes sororia* Benth. (*l.c.*) was described from five collections (out of three States) which are neither homogeneous nor conspecific. The two male plants (Grampians and St. Vincent's Gulf) are each accompanied by an ms. label "*X. sororia*" in Mueller's handwriting, and are accepted as typifying this name; a Victorian female plant (from Mt. M'Ivor) and the two other females from Queensland are referable either to forms of *L. filiformis* or some closely related species. Bentham's description of *X. caespitosa* embraces the male plants of two species—one with fine filiform leaves, <0.5 mm. wide, and very dark widely scattered flowers (the true *L. caespitosa* that is confined to W.A.), the other with coarser, broader leaves to 18" long and paler flowers more densely aggregated (*L. sororia*, as recognized above).]

5. Flowers on pedicels 3-6 mm. long, the clusters isolated, often numerous and paniculate, \pm whitish from the small, massed, obovate bracteoles (leaves 2-3 mm. wide, rigidly erect, greyish, \pm scaberulous:

682. *L. multiflora* (R. Br.) Britten in Banks & Soland. *Ill. aust. Plant. Cook's Voy.* 3: 95, t. 313 (1905).

Xerotes multiflora R. Br. *Prodr. Flor. Nov. Holl.* 262 (1810)

Illust.: Miller in Banks & Solander (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 261 (1943); Williamson, *Vict. Nat.* 45: 34 fig. 3 (1928); Sulman, *Aust. Wild Flowers* ser. 2: t. 51 (1913), as "*Xerotes brownii*".

Vern.: Many-flower Mat-rush. *Distr.*: Widespread on heaths and in open forest-land almost throughout Victoria, but not in the Mallee or alps and of rather uncommon occurrence (Lower Glenelg R., Portland, Black Range, Grampians, St. Arnaud, Maryborough, Bendigo, Mia Mia near Redesdale, Brisbane Range, Torquay, Anglesea, Studley Park on Yarra R., Tallarook, Rushworth, Nathalia, Rutherglen, Violet Town, Wodonga, Bright, Upper Murray R., Upper Cann R. at Mt. Kaye etc.); all States except Tas., N. Terr. (Arnhem Land).

—Flowers sessile

6. Clusters of flowers few (up to 7), \pm 1 cm. wide or more, on an undivided scape, the individual florets subtended by fringed bracteoles which impart a \pm woolly appearance to the cluster (Mallee and far western plants)

Clusters of flowers numerous and paniculate or, if ever reduced to 7, then only \pm 5 mm. wide, never woolly

7. Leaves greyish, obviously scaberulous, 1-2 mm. wide; scape rather stout, <5" long; panicle \pm branched and usually >1 cm. wide; bracts few, lax, never pungent, shorter than flower-clusters; perianth-segments obtuse, yellowish, united in the lower half:

683. *L. glauca* (R. Br.) Ewart in *Proc. roy. Soc. Vict.* new ser. 28: 220 (1916)
Xerotes glauca R. Br. *Prodr. Flor. Nov. Holl.* 260 (1810).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 263 (1943); Williamson, *Vict. Nat.* 45: 34 fig. 7 (1928); Schnizlein, *Icon. Fam. nat. Regn. veg.* 1: t. 51b fig. 1 (1845), as "*Xerotes glauca*".

Vern.: Pale Mat-rush. *Dist.*: Scattered through Victoria, except for grasslands, alpine tracts and dense forest areas, but usually uncommon, and rare in East Gippsland (Lower Glenelg R., Portland, Hawkesdale, Dundas & Black Ranges, Big & Little Deserts, Dimboola, Jeparit, Wyperfeld Nat. Park, Moyston, Bealiba, Creswick, Werribee, Arthur's Seat, Yering, Graytown, Chiltern, Ovens R., Snowy Ck, Upper Murray R., Murrungowar Rd, Maramingo Ck near Genoa); all States except Qd.

[Populations on Mallee sand-hills near Dimboola and in far north-western Victoria are distinguished by *much longer* (1 ft. or more), relatively narrower leaves, very filamentous stem-bases and larger inflorescences (both male and female). These are doubtless referable to *Xerotes glauca* R. Br. var. *occidentalis* Benth. *Flor. aust.* 7: 106 (1878), described from Western Australian collections; but, until a thorough investigation of the genus be undertaken, the propriety of effecting a new combination under *Lomandra* is questionable. *X. elongata* Benth. also seems very close to, if not inseparable from, the large Mallee form (?) of *Lomandra glauca*.]

—Leaves *bright green, smooth*; scape *>6"* long; bracts *numerous, rigid, ± pungent*; perianth-segments narrow, *acutish* with *± indurate tips*, often dark, *free* or united only at base 8

8. Leaves 2-8 mm. wide; scape *stout*, 5-10 mm. wide; panicle *much branched*, *>4"* long, *>20* mm. wide; bracts 1-3 cm. long, *far exceeding* the flower-clusters (widespread variable tussock-plant):

684. *L. longifolia* Labill. *Nov. Holl. Plant. Specim.* 1: 92, t. 119 (1805).

Illust.: Labillardière (*l.c.*); Galbraith, *Wildflowers Vict.* t. 12 (1950); Black, *Flor. S. Aust.* ed. 2: fig. 260 (1943); Williamson, *Vict. Nat.* 45: 34 fig. 4 (1928); Sulman, *Aust. Wild Flowers* ser. 2: t. 50 (1913), as "*Xerotes longifolia*"; Nudder in Banks & Solander, *Ill. aust. Plant. Cook's Voy.* 3: t. 312 (1905); Baillon, *Hist. Plant.* 12: fig. 390, 391 (1894); Drake in *Edwards' bot. Reg.* 58: t. 3, col. (1839), as "*Xerotes longifolia*."

Vern.: Spiny-headed Mat-rush (Long Mat-rush, Sagg—Tas.). *Dist.*: Excepting the Mallee, northern plains and grassland areas, abundant from sea-level to the alps almost throughout Victoria, on heaths, river-banks, rocky cliffs and various forest formations; Tas., S.A. (south-east), N.S.W., Qd (as far as Cape York Peninsula).

[There is much variation in width of leaves and dimensions of inflorescence throughout the State; some highland populations, with narrow condensed inflorescences, may warrant segregation at the varietal or subspecific level.]

—Leaves 0.5-1.5 mm. wide; scape exceedingly slender; panicle narrow, sparingly branched, 1-4" long, often reduced to a *single spike* (5-10 mm. wide) with distant flower-clusters; bracts usually much *<1* cm. long, *not* or only slightly exceeding the flowers (plant of far eastern ranges):

685. ? *L. confertifolia* (F. M. Bailey) A. Fahn in *J. Linn. Soc. (Bot.)* 55: 168 (1954).

Xerotes confertifolia F. M. Bailey in *Qd agric. J.* 25: 11 (1910).

Illust.: Nil.

Vern.: Slender Mat-rush. *Dist.*: Restricted in Victoria to forest-land of the far east, usually on granite hills (e.g. Mt. Kaye, Genoa Peak, Howe Range); also N.S.W., Qd (southern).

[Victorian populations are not identical with the typical form from Glasshouse Mts. etc. (Qd); but they seem close enough to be linked with *L. confertifolia* at the subspecific level.]

9. Leaves flat, \pm *scabrid*, 1-2 ft. long, 1.5-3 mm. wide; flower-clusters *ovoid to cylindric*, completely *annular* and widely spaced at irregular intervals along scape (sometimes solitary); bracteoles torn *almost to the base* into numerous crisped filaments, *as long as* the flowers which appear to be *embedded in wool*:

686. *L. leucocephala* (R. Br.) Ewart in *Proc. roy. Soc. Vict.* new ser. 28: 220 (1916).

Xerotes leucocephala R. Br. *Prodr. Flor. Nov. Holl.* 260 (1810).

Illustr.: Black, *Flor. S. Aust.* ed. 2: fig. 267 (1943); Williamson, *Vict. Nat.* 45: 34 fig. 5 (1928).

Vern.: Woolly Mat-rush (White Mat-rush). *Distr.*: Frequent on sandy rises of the Mallee in western Victoria (e.g. Dimboola, Big & Little Deserts, Jeparit, Lake Hindmarsh, Nandaly, Ouyen, Far North-west), extending up the Murray Valley to Cohuna and Echuca, and reaching Kyabram district in the Goulburn Valley; all mainland States, Cent. Aust.

—Leaves *reduced* to sheathing basal scales, their place being taken by *smooth*, rigid, *terete*, *pungent-pointed*, barren, wire-like stems or scapes 6-12" (seldom to 18") high; flower-clusters *globular*, usually close together; bracteoles fringed for *half their length*, *shorter than* flowers which are *exserted* from the "wool":

687. *L. juncea* (F. Muell.) Ewart in *Proc. roy. Soc. Vict.* new ser. 28: 220 (1916).

Xerotes juncea F. Muell. in *Trans. Vict. Inst.* 135 (1855).

Illustr.: Black, *Flor. S. Aust.* ed. 2: fig. 264 (1943); Williamson, *Vict. Nat.* 45: 34 fig. 1 (1928).

Vern.: Desert Mat-rush. *Distr.*: Scattered in Victoria on sandy ground through more western parts of the Mallee, and rather uncommon (Big & Little Deserts, near Lake Hindmarsh, Kulkyn Nat. Forest), with an isolated occurrence near Casterton on the Glenelg R.; also S.A.

FEMALE PLANTS (shortened key)

- | | |
|---|---|
| 1. Flowers sessile in dense clusters or heads | 5 |
| Flowers scattered or close, but <i>not</i> in obvious clusters | 2 |
| 2. Inner perianth-segments larger and thicker than outer 3 | 4 |
| Perianth-segments all similar, relatively thin | 3 |
| 3. Inflorescence <i>smooth</i> ; perianth <i>whitish</i> , 4-6 mm. long; capsule ovoid, 7-9 mm. long, <i>dull brownish</i> , with numerous prominent <i>vertical striations</i> : | |

L. effusa (Lindl.) Ewart [See No. 678].

Inflorescence \pm *scabrid*; perianth *brownish*, 2-3.5 mm. long; capsule trigonous-globoid, 5 mm. long, *pale yellow* or *greenish*, *smooth*, *shining*:

L. micrantha (Endl.) Ewart [See No. 679].

4. Flowers *pedicellate*, on a *scabrid* panicle 1-2" long; capsule ovoid, 5 mm. long, with thin \pm *shiny* valves:

L. filiformis (Thunb.) Britten [See No. 680].

Flowers *sessile*, on a *smooth* spike to 1" long; capsule globular, 5-6 mm. long, with thick dull valves:

L. sororia (F. Muell. ex Benth.) Ewart [See No. 681].

5. Flower-clusters 1-7, appearing *woolly* (from the numerous fringed bracteoles) 7

Flower-clusters *never* woolly (bracteoles entire) 6

6. Cluster or head *solitary*, near base of plant, much exceeding bracts; capsule ovoid, 4-6 mm. long, transversely wrinkled:

L. glauca (R. Br.) Ewart [See No. 683].

Clusters of flowers *several* (at regular intervals along spike), much *exceeding* bracts; capsule trigonous-globoid, 6 mm. long, at length blackish and transversely wrinkled:

L. multiflora (R. Br.) Britten [See No. 682].

Clusters *numerous*, in a *narrow panicle*, *shorter than* the subtending, \pm pungent bracts; capsule ovoid, 5-6 mm. long, *greenish-brown*, smooth and *shining* (leaves 3-8 mm. broad):

L. longifolia Labill. [See No. 684].

As for the last, but panicle often reduced to a *single spike* (1-3" long) with flowers longer than bracts, the *orange-coloured* capsule smaller and leaves <3 mm. wide (usually ± 1 mm.):

? **L. confertifolia** (F. M. Bailey) A. Fahn [See No. 685].

7. Flowers *embedded* among the woolly-fringed bracteoles; capsule obovoid or ovoid, 6-7 mm. long, white, smooth (normal leaves present, *flattened*, 1-2 ft. \times 1.5-3 mm.):

L. leucocephala (R. Br.) Ewart [See No. 686].

Flowers *exserted* beyond fringed bracteoles, capsule obovoid, 6-7 mm. long, slightly broader, deeply trigonous, greenish, with delicate transverse wrinkles (leaves replaced by *terete barren stems*):

L. juncea (F. Muell.) Ewart [See No. 687].

Tribe ANTHERICEÆ (syn. *Asphodeleæ*)

[The following order of genera in this large tribe accords with that of J. Hutchinson in *Families of Flowering Plants* ed. 2, 2 (*Monocotyledons*) pp. 596-598 (1959).]

214. CHAMÆSCILLA F. Muell. ex Benth. (1878)

688. **C. corymbosa** (R. Br.) F. Muell. ex Benth. *Flor. aust.* 7: 48 (1878).

Casia corymbosa R. Br. *Prodr. Flor. Nov. Holl.* 277 (1810).

Illust.: Speck in Blackall, *How to Know W. Aust. Wildflowers* t. 1 opp. 64, col. (1954); Lee, *Wild Life* 8: 394 (1946); Williamson, *Vict. Nat.* 45: 139 fig. 1 (1928); Rodway, *Tasm. Flor.* t. opp. 217 (1903); Fitch in Hooker f., *Flor. Tasm.* 2: t. 132 fig. A, col. (1858), as "*Caesia corymbosa*"; Darnell, *Hardy & Half-hardy Plant.* 1: 39 (1930); *New Phytol.* 13: 116 (1914).

Vern.: Blue Stars (Blue Squill). *Distr.*: Widespread and frequent on undisturbed, damp, sandy ground of western Victoria (e.g. Lower Glenelg R., Portland, Grampians, Dimboola, Mt. Cole, Bealiba, Creswick, Brisbane Range, Otways, Port Phillip region, Graytown), but rather uncommon in the east (Quail Id, Tonimbuk, Merriman's Ck, Wilson Prom., Genoa, Mallacoota, Barnawartha) and absent from the Mallee, alps and grassland plains; all States except Qd.

Diagn.: Small tuberous-rooted, renascent perennial; leaves few, radical, linear, grass-like, flaccid, 1-6" long, 3-10 mm. wide, channelled, often \pm bluish; inflorescence a loose, few-flowered (sometimes only 2-flowered) corymb 2-6" high (rarely to 10"); pedicels \pm 15 mm. long, with 1-2 small ovate bracts towards base; perianth-segments 6, equal, 8-10 mm. long, 3-5 mm. wide, blunt, bright-blue, each with 3 prominent veins, twisting together in a conspicuous spiral after anthesis; anthers 6, slightly coiled, \pm 0.5 mm. long, on slender free filaments \pm 3 mm. long; style simple, \pm 3 mm. long with almost capitate stigma; ovary \pm 2 mm. high, 3-locular, with numerous ovules in each loculus; fruit capsular, obcordate, 5-10 mm. long, with 3 deeply cleft, laterally compressed lobes that are acute along dorsal edges; seeds few in each lobe, flat, black, shining, 1.5-2 mm. wide.

215. *CÆSIA* R. Br. (1810)

1. Perianth yellowish-green, tardily opening, *not* twisted after flowering, 3-4 mm. long; capsule normally with 6 black, spherical, papillose but shining seeds 1.5-2 mm. in diameter (grass-like alpine plant with irregular few-flowered scapes 1-2" long):

689. *C. alpina* Hook. f. *Flor. Tasm.* 2: 373 (1860).

Chlorophytum alpinum (Hook. f.) Benth. ex J. G. Baker in *J. Linn. Soc. (Bot.)* 15: 328 (1876).

Illust.: Willis, *Vict. Nat.* 61: 188 (1945).

Vern.: Alpine Grass-lily. *Distr.*: Restricted in Victoria to the alps above 5000 ft., in damp, often shaded, parts of alpine herbfield and subalpine woodland where localized and rather rare (Mt. Speculation, Mt. Cobbler, Bogong High Plains near Niggerhead, Mt. Cope, Middle & Wild Horse Cks); also Tas., N.S.W.

[Although the perianth of *C. alpina* never twists, as it does in all other known species of *Cæsia*, the taxon is much better placed with this genus than under *Chlorophytum* where Baker assigned it (*l.c.*). The *spherical arillate seeds* are precisely those of *Cæsia*, whereas *Chlorophytum* has flattened exarillate seeds with acute margins. Future investigations may justify the erection of a distinct genus, as with *Chamæscilla* which also occupies a somewhat intermediate position between the same two genera. See notes by Willis in *Vict. Nat.* 61: 187-9 (1945).]

—Perianth tightly and *spirally-twisted* after flowering, 5-10 mm. long 2

2. Flowers *yellowish-green*, 5-6 mm. long; inflorescence divaricate, with many long slender branches; fruit either indehiscent and nut-like (with 1-2 seeds) or a 3- to 6-seeded capsule opening \pm readily (plant of sand-ridges in Far North-west, the grass-like leaves 1 ft. long or more):

690. *C. lateriflora* R. Br. *Prodr. Flor. Nov. Holl.* 277 (1810).

Corynotheca lateriflora (R. Br.) F. Muell. ex Benth. *Flor. aust.* 7: 49 (1878).

Illust.: Gauba, *Vict. Nat.* 65: 112 fig. B (1948), as "*Corynotheca lateriflora*".

Vern.: Sand Lily. *Distr.*: Very localized and rare in Victoria where known only from the Kulkyn Nat. Forest near Lake Hattah, on sand-hills associated with *Callitris preissii* and *Casuarina cristata*; inland parts of all mainland States but in S.A. apparently unknown beyond Lake Bonney near Renmark, also N. Terr. (Cent. Aust., Arnhem Land and islands in Gulf of Carpentaria).

[E. Gauba stated in *Vict. Nat.* 65: 113 (1948), "there is really no essential difference between *Casia* and *Corynotheca*, and it would be much better to adopt Baker's point of view, returning the three *Corynotheca* species of Mueller to *Casia*"—an opinion now endorsed. Apparently all Victorian, New South Wales and South Australian populations belong to Gauba's *Corynotheca lateriflora* var. *lavisperma* (l.c. 111), having quite smooth or at most minutely punctulate seeds.]

—Flowers lavender or pale to deep blue; inflorescence a raceme or few-branched panicle

3. Flowers scattered, on very slender axes, 4-6 mm. long, pale lavender-blue or almost whitish; upper floral bracts 1-2 mm. long;

691. *C. parviflora* R. Br. *Prodr. Flor. Nov. Holl.* 277 (1810).

Illust.: Ostenfeld, *Biol. Medd. Kbh.* 3: t. 2 (1921).

Vern.: Pale Grass-lily. *Distr.*: Scattered through damp heaths of southern Victoria from Lower Glenelg R. to Cann R. and locally rather common (e.g. Grampians, Otways, Dandenongs, Kinglake Tonimbuk, Quail Id, Waratah Bay, Wilson Prom., Coringle near Orbost, Newton's Ck); Tas. (north-east), N.S.W., Qd, S.A. (Brighton—very localized), W.A.

—Flowers in dense clusters, \pm crowded (along upper part of axis), lilac-blue to deep bluish; upper floral bracts 3-5 mm. long:

692. *C. vittata* R. Br. *Prodr. Flor. Nov. Holl.* 277 (1810).

Illust.: Galbraith, *Wildflowers Vict.* t. 6 (1950); Williamson, *Vict. Nat.* 45: 139 fig. 2 (1928); *New Phytol.* 13: 116 (1914).

Vern.: Blue Grass-lily. *Distr.*: Widespread in open woodland throughout the Victorian lowlands, but uncommon in the Far North-west (e.g. in such dispersed localities as Lower Glenelg R., Grampians, Serviceton, Ararat, Creswick, Campaspe R., St. Arnaud, Hawkesdale, Meredith, Torquay, Arthur's Seat, Doncaster, Graytown, Rushworth, Warby Range, Rutherglen, Delatite R., W Tree near Buchan, Cann R.); all States.

216. HERPOLIRION Hook. f. (1853)

693. *H. novæ-zelandiæ* Hook. f. *Flor. N.-Z.* 1: 258 (1853).

Illust.: Reeves in Garnet, *Vict. Nat.* 65: 7 (1948); Williamson, *Vict. Nat.* 45: 93 fig. 5 (1928); Crosby Smith in Laing & Blackwell, *Plant. N.Z.* ed. 3: fig. 34 (1927); Fitch in Hooker f., *Flor. Tasm.* 2: t. 132 fig. B, col. (1858), as "*H. tasmanicæ*".

Vern.: Sky Lily. *Distr.*: Scattered through damp alpine herbfield (above 4500 ft.) in eastern Victoria, but locally common (Lake Mountain near Marysville, Baw Baws, Mt. Buffalo, Bogong High Plains, Davey's High Plain at sources of Murray R.); N.S.W., Tas., N.Z.

Diagn.: Low rhizomic perennial, often forming extensive patches of turf; leaves crowded, stiff, grass-like, smooth, linear, 1-2.5" long, 2-4 mm. wide, flat to \pm involute, subglaucous, the outer spreading or even \pm recurved, the inner shorter erect and bract-like; flower bearing a remarkable resemblance to the lowly *Romulea nivalis* of Lebanon, solitary, sessile, \pm funnel-shaped and large for the size of plant; perianth-segments 6, similar, pale lilac-blue to almost white, 10-20 mm. long, 2-3 mm. wide, erect below but spreading from near middle; stamens 6, \pm half the length of perianth and attached to it at base,

filaments slightly pubescent, anthers 2-3 mm. long, slightly sagittate at base; style filiform with undivided stigmatic tip; capsule globose, obscurely trigonous 6-8 mm. long, with a few smooth, black, oblong seeds in each of the 3 loculi.

217. *ARTHROPODIUM* R. Br. (1810)

Stem 1-2 ft. high, usually *branched*; flowers in clusters of 2-3 to each bract, *pale lilac* or mauve-and-white, the segments 6-7 mm. long; anther *longer than* bearded part of filament (plant typically of sheltered places, usually in moist hilly country):

694. *A. milleflorum* (DC.) Macbride in *Contr. Gray Herb. Harv. new ser.* 56: 2 (1918).

Anthericum milleflorum DC. in Redouté *Liliacées* 1: t. 58 (1804);

Arthropodium paniculatum (Andr., ut *Anthericum* sp.) R. Br. *Prodr. Flor. Nov. Holl.* 276 (1810).

Illustr.: Redouté (*l.c.*); Edwards in *Curtis's bot. Mag.* 35: t. 1421, *col.* (1811), as "*A. paniculatum*"; Lindley in *Edwards' bot. Reg.* 10: t. 866, *col.* (1825), as "*A. minus*"; Williamson, *Vict. Nat.* 45: 71 fig. 3 (1928), as "*A. paniculatum*"; Meredith, *Bush Friends Tasm.* last ser. t. 7, *col.* (1891), as "*A. paniculatum*".

Vern.: Pale Vanilla-lily. *Distr.*: Widespread and not uncommon in cooler parts of Victoria, favouring sheltered situations in forests and deep rocky valleys, ascending to the alps and often frequent in subalpine woodland (e.g. such widely dispersed localities as Lower Glenelg R., Grampians, Mt. Cole, Creswick, Macedon, Brisbane Range, Dandenongs, Rushworth, Mt. Buffalo, Barry Mts., Bogong High Plains, Cobboras and Upper Murray, Bonang, Bendoc, Cann R., Combienbar, Wilson Prom., Upper Jamieson R., sources of Yarra R.); Tas., S.A. (south-east), N.S.W., Qd, N. Cal.

Stem <1 ft. high, usually *unbranched*; flowers 1 per bract, *rich purple*, the segments 4-5 mm. long; anther *shorter than* bearded part of filament (plant of grassland and drier open woodlands):

695. *A. minus* R. Br. *Prodr. Flor. Nov. Holl.* 276 (1810).

Illustr.: Williamson, *Vict. Nat.* 45: 71 fig. 4 (1928).

Vern.: Small Vanilla-lily. *Distr.*: Scattered through the Victorian lowlands, in savannah woodland or drier grassland formations where locally rather common, but receding because of settlement in many former habitats (e.g. Lower Glenelg R., Grampians, Dimboola, Far North-west, Swan Hill, Wycheproof, St. Arnaud, Creswick, Brisbane Range, Broadmeadows, Graytown, Rushworth, Nathalia, Rutherglen, Wodonga, with isolated occurrences in East Gippsland at Suggan Buggan & Tubbut); all States except W.A.

218. *DICHOPOGON* Kunth (1843).

Scape *branched* above; leaves 3-10 mm. broad, 3-12" long; flowers 1 per bract, *chocolate-scented*, the pedicel remaining *erect in fruit*; anther-appendages short, yellow, with congested papillae:

696. *D. strictus* (R. Br.) J. G. Baker in *J. Linn. Soc. (Bot.)* 15: 319 (1876).

Arthropodium strictum R. Br. *Prodr. Flor. Nov. Holl.* 276 (1810).

Illustr.: Fitch in *Curtis's bot. Mag.* 110: t. 6746, *col.* (1884); Lee, *Wild Life* 12: 202 (1950); Black, *Flor. S. Aust.* ed. 2: fig. 272 (1943); Bishop in Barrett, *Aust.*

Wildflower Book 64 (1942); Williamson, *Vict. Nat.* 45: 71 fig. 5 (1928); Fitch in Hooker f., *Flor. Tasm.* 2: t. 131, col. (1858), as "*Arthropodium laxum*"; Krause in Engler, *Natürl. PflFam.* ed. 2, 15a: fig. 104 (1930).

Vern.: Chocolate Lily (Grass Lily—N.S.W.). *Distr.*: Widespread and frequent in open forest, heath and grassland formations almost throughout western and north-eastern Victoria, but absent from the Mallee, alps and much of East Gippsland where rare (e.g. Lower Glenelg R., Grampians, Little Desert, Dimboola, Ararat, Mt. Korong, Creswick, Brisbane Range, Torquay, Port Phillip, Dandenongs, Alexandra, Rushworth, Warby Range, Rutherglen, Wilson Prom., Sale, Bairnsdale); all States.

Scape usually *undivided*, very slender; leaves 1-2 mm. broad, rarely > 3" long. often withered before flowers open; flowers 2-3 per bract, *vanilla-scented*, the pedicels \pm decurved and always *reflexed in fruit*; anther appendages elongated, with \pm scattered papillæ

697. *D. fimbriatus* (R. Br.) Macbride in *Contr. Gray Herb. Harv.* new ser. 56: 2 (1918).

Arthropodium fimbriatum R. Br. *Prodr. Flor. Nov. Holl.* 276 (1810).

Illust.: Williamson, *Vict. Nat.* 45: 71 fig. 6 (1928).

Vern.: Nodding Chocolate Lily. *Distr.*: Scattered throughout western Victoria on sandy ground of drier heaths and open forest, but seldom common, and rare in Mallee tracts (Black Range & Grampians, Little Desert, Lower Glenelg R., Upper Avoca R., Wycheproof, Swan Hill, Whipstick Scrub near Bendigo, Graytown, Kyabram); all States except Tas.

219. THYSANOTUS R. Br. (1810)

1. Stem very *flexuose*, climbing and *twining on other plants*, weak, slender, with many short branches; flowers numerous, solitary at ends of ultimate branchlets, the segments \pm 8 mm. long (leaves filiform, basal, withering early; (roots *tuberos*):

698. *T. patersonii* R. Br. *Prodr. Flor. Nov. Holl.* 284 (1810).

Illust.: Blackall, *How to Know W. Aust. Wildflowers* 66 (1954); Black, *Flor. S. Aust.* ed. 2: fig. 268 (1943); Williamson, *Vict. Nat.* 45: 93 fig. 1 (1928).

Vern.: Twining Fringe-lily. *Distr.*: Except in the alps and on grassland, a very widespread, common Victorian plant through the Mallee scrubs and drier forests to sandy heaths along the coast (e.g. in such well-scattered districts as Lower Glenelg R., Grampians, Big & Little Deserts, Wyperfeld Nat. Park, Kulkyn Nat. Forest, St. Arnaud, Donald, Ararat, Maryborough, Whipstick Scrub near Bendigo, Werribee & Lerderberg Gorges, Brisbane Range, Otways, Frankston, Tallarook, Rushworth, Nathalia, Benalla, Dargo, Bemm R., Cann R.), but localized in East Gippsland; all States except Qd.

—Stem *not* (or only slightly) *flexuose*, *never* twining; if flowers numerous, then segments 10-15 mm. long. 2

2. Stock *rhizomic*; scapes *branching from near base* 4
Stock with *tuberos roots*; scape simple or *branching high up* 3

3. Leaves almost *as long as* unbranched part of scape (6-12"), often present at flowering time; scape with several to many branches; flower-clusters (umbels) *pedunculate*; perianth 10-15 mm. long, the pedicel 8-12 mm. (widespread plant):

699. *T. tuberosus* R. Br. *Prodr. Flor. Nov. Holl.* 282 (1810).

Illust.: Galbraith, *Wildflowers Vict.* t. 7 (1950); Cooper, *Wild Life* 15: cover, col. (Feb. 1952), also 13: 455 (1951); Forster in Harris, *Wild Flowers Aust.* t. 41, col. (1947); Lee, *Wild Life* 8: 395 (1946); Bishop, *Wild Life* 2: 10 (Dec. 1940); Munro, *Wild Life* 2: 6 (May 1940); Thomson, *Flowers of our Bush* t. 4 (1929); Williamson, *Vict. Nat.* 45: 93 fig. 2 (1928); Relph in Pescott, *Native Flowers Vict.* t. opp. 91 (1914); Mort in Sulman *Wild Flowers N.S.W.* 1: t. 49 fig. 1 (1913), Hart in *Edwards' bot. reg.* 8: t. 655, col. (1822), as "*T. isantherus*"; Charsley *Wild Flowers Melb.* t. 6 fig. 1, col. (1867).

Vern.: Common Fringe-lily (Fringed Violet—N.S.W.). *Distr.*: Scattered in forest and scrub almost throughout Victoria, except the alps, and locally frequent (e.g. Lower Glenelg R., Little Desert, Far North-west, Grampians, Mt. Buangor, Mt. Ben Nevis, Creswick, Upper Campaspe R., Brisbane Range, Otways, Dandenongs, Kinglake Nat. Park, Alexandra, Strathbogie, Warby Range, Barnawartha, Snowy Ck, Upper Murray R., Genoa Peak, Wingan Inlet, Lake Tyers, Wilson Prom., Quail Id, Arthur's Seat, Mt. Skene); N.S.W., Qd, S.A., ? W.A., N. Terr. (Cent. Aust. & Arnhem Land.)

—Leaves much *shorter than* non-flowering part of scape, withering very early; scape simple or with 1-3 branches; flower-clusters *sessile*; perianth 8-10 mm. long, the pedicel 5-7 mm. (rare plant of sand-hills along Murray R.):

700. *T. baueri* R. Br. *Prodr. Flor. Nov. Holl.* 283 (1810).

Illust.: Mueller, *Key Syst. Vict. Plant.* 2: fig. 119 (1886).

Vern.: Mallee Fringe-lily. *Distr.*: Localized and rare in Victoria where known only from a few occurrences in Mallee scrub along the Lower Murray R. (Swan Hill district, Kulkyn Nat. Forest near Lake Mournpall, near Mildura); S.A., N.S.W., Qd.

4. Scape 1-2 mm. wide at base, branching 4 times or more; fringed petals 10-12 × 5-6 mm. (plant of western heaths):

701. *T. dichotomus* (Labill.) R. Br. *Prodr. Flor. Nov. Holl.* 284 (1810).

Ornithogalum dichotomum Labill. *Nov. Holl. Plant. Specim.* 1: 83, t. 109 (1805).

Illust.: Labillardière (*l.c.*); Black, *Flor. S. Aust.* ed. 2: fig. 269 (1943); Williamson, *Vict. Nat.* 45: 93 fig. 4 (1928).

Vern.: Branching Fringe-lily. *Distr.*: Localized and rather rare in Victoria where confined to a few western heaths (Jan Juc & Anglesea, Grampians, Glenelg R.); also S.A., ? W.A.

[Victorian and South Australian populations are not identical with the truly dichotomous plant originally described from Western Australia, and their actual affinities are closer to *T. juncifolius*—*teste* Dr. N. H. Brittan, Perth, W.A.]

—Scape almost *capillary*, ± 0.5 mm. wide at base, branching only once or twice; fringed petals ± 8 × 4 mm. (plant of far eastern heaths):

702. *T. juncifolius* (Salisb.) J. H. Willis & A. B. Court in *Muelleria* 1: (1956).
Chlamysporum juncifolium Salisb. *Parad. Lond.* t. 103 (1807);
T. juncus R. Br. *Prodr. Flor. Nov. Holl.* 283 (1810).

Illust.: Salisbury (*l.c.*); *Curtis's bot. Mag.* 49: t. 2351, col. (1822), as "*T. juncus*"; Hart in *Edwards' bot. Reg.* 8: t. 656, col. (1822), as "*T. juncus*"; Curtis in Engler, *Natürl. PflFam.* ed. 2, 15a: fig. 105 B-D (1930), as "*T. juncus*".

Vern.: Rush Fringe-lily. *Distr.*: Restricted in Victoria to near-coastal damp heaths of the far east, where locally not uncommon (Reedy Ck near Cann R., Mallacoota, Genoa, Maramingo Ck 4 miles from N.S.W. border); also N.S.W. (at least as far north as Port Macquarie).

220. **ASPHODELUS* L. (1753)

703. **A. fistulosus* L. *Spec. Plant.* 1: 309 (1753).

Illust.: Edwards in *Curtis's bot. Mag.* 25: t. 984, col. (1806); Whittet, *Weeds* (N.S.W. Dep. Agric.) t. 54, col. (1958); Everist, *Common Weeds Farm & Pasture* fig. 21 (1957); Meadly, *J. Dep. Agric. W. Aust.* ser. 3, 4: t. opp. 529, col. (1955); Richardson, *J. Dep. Agric. S. Aust.* 86: 315-316 (1953), also 11: 240 (1907); Wall in Clarke, *Bull. Dep. Agric. S. Aust.* 406: t. opp. 35, col. (1949); Black, *Flor. S. Aust.* ed. 2: fig. 274 (1943); Davey, *J. Dep. Agric. Vict.* 20: 669 (1922); Maiden, *Weeds N.S.W.* t. opp. 40, col. (1920); Wauer in Ewart, *Weeds . . . Vict.* t. opp. 61, col. (1909); Coste, *Flor. Franc.* 3: fig. 3475 (1906); Reichenbach, *Icon. Flor. germ.* 10: t. 513 fig. 1117, col. (1848).

Vern.: Onion-weed (Wild Onion, Asphodel). *Distr.*: Indigenous from the Mediterranean region to western Asia and northern India; introduced into N.Z., temperate parts of Qd, N.S.W., S.A., W.A. and Victoria where a noxious weed in many western districts, chiefly on open sandy ground (Far & Extreme North-west, Swan Hill, Dimboola, Nhill, St. Arnaud, Maldon, Warrnambool, Torquay, Queenscliff, mouth of Yarra R. etc., with an isolated record for Trafalgar).

Diagn.: Annual or biennial with long, fleshy-fibrous, bright yellow roots; leaves erect, 4-10" long, 2-4 mm. wide, fleshy, tubular, striated, \pm greyish, plano-convex in section, with scabrid or minutely toothed edges, acuminate at apex; flowering stem hollow, branching from about middle into 2-6 long racemes, the whole \pm 1-2 ft. high; flowers pink and white, almost erect on short jointed pedicels with scarious bract at base; perianth-segments 6, equal, free, blunt, 7-10 mm. long, 2-4 mm. wide, each with a conspicuous reddish-brown central nerve; anthers 6, orange, 1.5-2 mm. long, versatile on filaments \pm 5 mm. long; style \pm 7 mm. long, with shortly 3-lobed stigma; capsule dark, subglobose, \pm 5 mm. wide and high, 3-locular, with blunt notched valves; seeds 3-6, black, triangular, \pm 3 mm. long, with 3-4 bold transverse wrinkles.

221. *BULBINE* Willd. (1809)

Perianth-segments 10-15 mm. long; *all staminal filaments* bearded; ovules 3-5 per loculus; capsule \pm 6 mm. wide (roots proceeding from a *bulbous tuber* beneath stock):

704. *B. bulbosa* (R. Br.) Haw. *Revis. Plant. Succul.* 33 (1821).
Anthericum bulbosum R. Br. *Prodr. Flor. Nov. Holl.* 275 (1810).

Illust.: Hooker in *Curtis's bot. Mag.* 57: t. 3017, col. (1830), as "*Anthericum bulbosum*", also 59: t. 3129, col. (1832), as "*Anthericum semibarbatum*"; Galbraith, *Wildflowers Vict.* t. 11 (1950); Mercer in Whittet, *Weeds* (N.S.W.

Dep. Agric.) fig. 135 (1958); Mercer in Hurst, *Poison Plant. N.S.W.* 57 (1942); Black, *Flor. S. Aust.* ed. 2: fig. 271 (1943); Forster in Harris, *Wild Flowers Aust.* t. 9, col. (1947); Lee, *Wild Life* 8: 394 (1946); Galbraith, *Wild Life* 2: 12 (Sept. 1940); Williamson, *Vict. Nat.* 45: 38 fig. 8 (1928); Wills in Bailey, *Qd agric. J.* 1: t. opp. 329 (1897); *New Phytol.* 13: 116 (1914); Charsley, *Wild Flowers Melb.* t. 11 fig. 7, col. (1867).

Vern.: Bulbine Lily (Wild Onion, Native Leek—N.S.W.). *Distr.*: Abundant in open places almost throughout Victoria, excepting the Mallee and alps where localized and rather uncommon (e.g. Lower Glenelg R., Grampians, Hamilton, Ararat, Little Desert, Donald, Swan Hill, Mt. Korong, St. Arnaud, Whipstick Scrub near Bendigo, Creswick, Werribee & Lerderderg Gorges, Brisbane Range, Torquay, Port Phillip, Tallarook, Rushworth, Nathalia, Rutherglen, Beechworth, Omeo, Mt. Buller, Mt. Bogong, Barry Mts., Dargo High Plains, Suggan Buggan, Sperm Whale Head, Wilson Prom.); temperate parts of all States except W.A.

Perianth-segments \pm 6 mm. long; only the 3 filaments opposite inner segments bearded; ovules 2 per loculus; capsule 3-4 mm. wide (stock without any tuber, the roots fibrous; anthers often reddish-orange):

705. *B. semibarbata* (R. Br.) Haw. *Revis. Plant. succul.* 33 (1821).

Anthericum semibarbatum R. Br. *Prodr. Flor. Nov. Holl.* 275 (1810).

Illust.: Williamson, *Vict. Nat.* 45: 38 fig. 9 (1928).

Vern.: Leek Lily. *Distr.*: Abundant in the far north-west of Victoria and along the Murray Valley to beyond Swan Hill, usually on sand, but scattered in other parts and absent from montane or alpine regions (e.g. Wycheproof, Dimboola, Kaniva, Mt. Arapiles, Lower Glenelg R., Ballarat, Whipstick Scrub near Bendigo, Wilson Prom., Bairnsdale, Murrungowar, Cann R.); all Australian States.

[A. Borzi in *Boll. Orto bot. Palermo* 1: 20 (1897) erected the genus *Bulbinopsis* for *B. semibarbata*, but Australian botanists have not attached much importance to his generic criteria.

Another member of the tribe *Anthericeæ*, naturalized on parts of the Australian coast, is the sand-loving South African *Anthericum divaricatum* N.J. Jacq. It is frequent on beach-dunes north and south of Perth, W.A., and was collected at Coode Island, Melbourne, in Nov. 1912; but the plant does not seem to have persisted there and is not at present known from anywhere else in Victoria. *A. divaricatum* is a tuberous plant, with a large rosette of straggling prostrate leaves (1 ft. long or more) and a stout, much-branched, glabrous inflorescence with many small greenish-white flowers; when mature, the fruiting panicle rolls around in the wind, shaking out the numerous seeds from each capsule.]

Tribe JOHNSONIEÆ

222. TRICORYNE R. Br. (1810)

706. *T. elatior* R. Br. *Prodr. Flor. Nov. Holl.* 278 (1810).

Illust.: Galbraith, *Wildflowers Vict.* t. 8 (1950); Black, *Flor. S. Aust.* ed. 2: fig. 270 (1943); Williamson, *Vict. Nat.* 45: 38 fig. 7 (1928); Endlicher, *Icon. Gen. Plant.* t. 61 (1838); Bauer, *Ill. Flor. Nov. Holl.* t. 11, col. (1813).

Vern.: Yellow Rush-lily (Yellow Autumn Lily). *Distr.*: Abundant in Victoria on heath, grassland, more open forest and Mallee country, but not in the alps (e.g. such widely spread localities as Kulkyne Nat. Forest, Little Desert, Lower Glenelg R., Mt. Cole, Colac, Otways, Creswick, Whipstick Scrub near Bendigo, Tallarook, Nathalia, Alexandra, Barnawartha, Upper Murray R., Wulgulmerang, Buchan, Bindi, Brodribb R., Sale, Quail Id, Port Phillip); temperate parts of all States.

Diagn.: Wiry, rush-like perennial 6-18" high, with bare, slender, sulcate branches and clusters of a few small scarious bracts at nodes of the diffuse inflorescence; leaves few, linear, grass-like, 1-4" long, 1-3 mm. wide, withering and disappearing early or all reduced to \pm scarious bracts; flowers yellow, 2-6 together in terminal umbels subtended by a few whitish papery bracts 3-5 mm. long, their slender pedicels 3-6 mm. long, often recurving and always persisting long after anthesis; perianth-segments 6, equal, free, oblong-linear, 6-12 mm. long, 1-2 mm. wide, bluntish, closely 3-nerved, sometimes greenish externally, spirally twisting together above the ovary after anthesis; anthers 6, \pm 0.7 mm. long, versatile but almost erect on slender filaments \pm 5 mm. long, the latter each bearing a dense woolly tuft of golden hairs toward the middle; style undivided, 5-6 mm. long; ovary sessile, deeply 3-lobed and 3-locular, with 2 erect ovules per loculus; fruit divided to base into 3 (or by abortion fewer) 1-seeded nutlets each 3.4 \times 1.5-2 mm., slightly fleshy and manifestly reticulate when dried; seed black, ellipsoid, with minutely reticulate-areolate shining testa.

223. LAXMANNIA R. Br. (1810)

Flower-heads *sessile* in the tufts of leaves; flowers *white* (stems seldom >2 " long; aerial roots often descending from nodes of the wiry branches):

707. *L. sessiliflora* Decaisne in *Nouv. Ann. Mus. Hist. nat.*, Paris 3: 500, t. 16 (1834).

Bartlingia sessiliflora (Decaisne) F. Muell. in *Pap. roy. Soc. Tasm.* 1877: 116 (1878).

Illust.: Decaisne (*l.c.*); Williamson, *Vict. Nat.* 45: 139 fig. 6 (1928); Eckert, *Vict. Nat.* 10: 146, 147 (1893)—latter two as "*Bartlingia sessiliflora*".

Vern.: Dwarf Wire-lily (Nodding Lily). *Distr.*: Frequent on drier heaths and open sandy forest-land of western and southern Victoria, but neither in the alps nor Far North-west (Big & Little Deserts, Grampians, Lower Glenelg R., Mt. Clay near Portland, Otways, Brisbane Range, Whipstick Scrub near Bendigo, eastern scrubs of Port Phillip Bay, Wilson Prom., Tonghi plains & Reedy Ck near Cann R., Betka R. head etc.); Tas., S.A., W.A., N.S.W. (south-eastern).

Flower-heads on *slender peduncles* up to 4" long; flowers usually *pink* (stems often 3-6" or longer):

708. *L. gracilis* R. Br. *Prodr. Flor. Nov. Holl.* 286 (1810).

Bartlingia gracilis F. Muell. *Key Syst. Vict. Plant.* 1: 436 (1888).

Illust.: Williamson, *Vict. Nat.*, 45: 139 fig. 5, 5a (1928), as "*Bartlingia gracilis*"; Domin, *Bibl. bot.*, Stuttgart 20: 523 (1915); Schnizlein, *Icon Fam. nat.* 1: t. 55d fig. 2-10 (1849); Engler & Prantl, *Natürl. PflFam.* II 5: fig. 32 D-G (1888).

Vern.: Slender Wire-lily (Silverweed Lily). *Distr.*: In Victoria scattered through Gippsland where localized and uncommon, usually in open rocky or sandy places (Mt. Ligar near head of Macallister R., near Sale, Bairnsdale, Boundary Ck at Wulgulmerang, Maramingo Ck near Genoa), with isolated western occurrences in the Grampians and near Casterton; also N.S.W., Qd.

[In *Vict. Nat.* 45: 139 fig. 5a, 141 (1928), H. B. Williamson distinguishes as the var. *nana* a pygmy form of *L. gracilis* from the summit of Mt. William (Grampians). Individual plants are only about 1" high, with peduncles 3-10 mm. long, and they seem to be rather the result of a cold, unfavourable environment than a distinct, stable entity justifying varietal recognition.]

224. BORYA Labill. (1805)

709. *B. nitida* Labill. *Nov. Holl. Plant. Specim. 1*: 81, t. 107 (1805).

Illust.: Labillardière (*l.c.*); Blackall, *How to Know W. Aust. Wildflowers* 67 (1954); Williamson, *Vict. Nat.* 45: 139 fig. 4 (1928); Diels in Engler, *Natürl. PflFam.* ed. 2, 15a: fig. 118 (1930); Ostenfeld, *Biol. Medd. Kbh.* 3²: t. 3 (1921); Engler & Drude, *Veg. Erde* 7: 137 (1906); Engler & Prantl, *Natürl. PflFam.* II 5: fig. 32 H-J (1888).

Vern.: Pincushion Lily (Pincushion Plant, Pin-grass). *Distr.*: Very rare and localized in Victoria where known only from a certain peak in the northern Grampians; otherwise widespread in W.A. (from Cape Arid area on the south-east coast to Greenough R. beyond Geraldton.).

Diagn.: Low, densely-tufted, wiry perennial forming cushion-like clumps 3-6" high, spreading out by adventitious roots and off-shoots, the stems always tightly invested with overlapping, purplish, scale-like bases of old leaves; leaves crowded, and erect, spreading or recurved, rigid, narrow-linear, 1-3 cm. long (sometimes more), 0.5-1 mm. wide, pungently pointed, much dilated at base, biconvex to \pm quadrangular in section, with massive midrib; flowering peduncles terminal, solitary on each shoot, erect, 1-2" long (rarely more), \pm angular; flowers in a dense, terminal, ovoid to semiglobular head (8-12 mm. wide) surrounded by 3-7 stiff, sharp, lanceolate to linear, leaf-like outer bracts each 5-10 mm. long, and subtended by several brown or blackish, \pm obtuse, broader inner bracts 4-7 mm. long; perianth whitish, the tubular portion 5-7 mm. long and enveloped by a dark bracteole of equal length, the 6 linear spreading lobes slightly shorter; anthers 6, \pm 0.5 mm. long, on slender filaments (3-4 mm. long) that are inserted at base of lobes; style filiform, 5-8 mm. long, with minute capitate stigma; ovary sessile, ovoid, 3-locular, with numerous ovules; capsule brown, ellipsoid, 2-3 mm. long, finely and transversely wrinkled; seeds rather few, black, shining, subglobular, \pm 0.5 mm. wide, minutely papillose.

225. SOWERBÆA Sm. (1798)

710. *S. juncea* Sm. in *Trans. Linn. Soc. Lond.* 5: 160, t. 6 (1800).

Illust.: Smith (*l.c.*); Edwards in *Curtis's bot. Mag.* 28: t. 1104, col. (1808); Forster in Harris, *Wild Flowers Aust.* t. 51, col. (1947); Ewart, *Flor. Vict.* fig. 143 (1931); Williamson, *Vict. Nat.* 45: 93 fig. 6 (1928); Mort in Sulman *Wild Flowers N.S.W.* 1: t. 49 fig. 2 (1913); Andrews, *Bot. Repos.* 2: t. 81, col. (1800).

Vern.: Rush Lily (Vanilla Plant—N.S.W.). *Distr.*: In Victoria confined to eastern coastal districts between Waratah Bay and Cape Howe, scattered but locally not uncommon on poor sandy heaths and "grass-tree plains" (Wilson Prom., Woodside, Merriman's Ck, Dutson near Sale, Marlo, Murrungowar Road, Betka R. head, Maramingo Ck near Genoa, etc.); also N.S.W., Qd.

Diagn.: Tufted, fibrous-rooted perennial with short woody rhizomes; leaves radical, \pm erect, linear-filiform, grass-like, 3-8" long (or more), \pm 1 mm. wide, with wide, shining, transparent, sheathing margins along basal 1-2"; scapes erect, terete, smooth, \pm 1 ft. tall (sometimes to 2 ft.), bearing a terminal umbel

of many rose-pink or purplish, vanilla-scented flowers, subtended by several pink, ovate papery bracts to 8 mm. long (the inner, imbricate bracts shorter and often with lacinate-fimbriate margins); perianth on a filiform pedicel attaining 5-7 mm. at anthesis, the 3 outer segments oval-oblong, bluntish, 5-6 mm. long, the 3 inner slightly longer, all free, pink and \pm diaphanous; anthers 3, opposite inner segments, pale yellow, linear, 2-3 mm. long, on shorter flattened filaments alternating with 3 similar but anther-less filaments; style filiform, \pm 3 mm. long; ovary sessile, \pm globular, 3-locular, with 2 or more ovules per loculus; capsule pale brown, 2-3 mm. long, with 3-6 relatively large, black, angular seeds 1.5-2 mm. long and minutely verrucose.

Tribe ASTELIÆ (syn. *Milliganieæ*)

226. *ASTELIA* Banks & Soland. ex R. Br. (1810)

Leaves <1 ft. long (usually 3-6"), <1" wide at base; inflorescence few-flowered, 1-4" high, almost devoid of bracts; ovary 1-locular; female perianth not enlarging; berry bright red, oblong, 3-4 mm. wide (densely matted alpine plant, forming extensive patches in bogs):

711. *A. alpina* R. Br. *Prodr. Flor. Nov. Holl.* 291 (1810).

Illust.: Williamson, *Vict. Nat.* 45: 8 fig. 9 (1928); Skottsberg, *K. svenska Vetensk Akad. Handl.* ser. 3, 14²: 27 fig. 27-42 (1934); Hooker, *Bot. Misc.* 1: t. 3 (1830).

Vern.: Silver *Astelia* (Perching Lily, Artichoke—Tas.). *Distr.*: A scattered but locally frequent component of bog and herbfield formations in the Victorian, alps above 4500 ft. (Lake Mountain, Mts. Baw Baw, Wellington, Stirling, Buller & Buffalo, Bogong High Plains where widespread between Mts. Fainter, Cope & Bogong); also Tas., N.S.W. (at higher altitudes in Kosciusko region).

[Victorian and New South Welsh populations are apparently all referable to the var. *novæ-hollandiæ* Skottsberg in *K. svenska Vetensk Akad. Handl.* ser. 3, 14²: 28 (1934), distinguished from the typical, Tasmanian form by its narrower leaves with thinner pellicles, rather smaller female flowers and fewer seeds (about 5 per fruit).]

Leaves 2-6 ft. long, 2-4" broad at base; inflorescence stout, 8-16" high, with numerous flowers in dense paniculate racemes subtended by large *spathaceous* bracts; ovary 3-locular; female perianth at first green, the tube becoming swollen, fleshy and yellow in fruit; berry orange, ovoid to \pm globular, 4.5-6 mm. wide (very robust tufted plant of shady mountain gullies):

712. *A. nervosa* Banks & Soland. ex Hook. f. *Flor. N.-Z.* 1: 260 (1853).

Illust.: Crosby Smith in Laing & Blackwell, *Plant. N.-Z.* ed. 6: fig. 31 (1957); Skottsberg, *K. svenska Vetensk Akad. Handl.* ser. 3, 14²: 60 fig. 161-184 (1934).

Vern.: Tall *Astelia*. *Distr.*: Restricted in Victoria to a few small patches in wet gully-heads along the Upper Latrobe and Bunyip River watershed, and in upper reaches of the Tomahawk & McCrea's Cks at Beenak, usually under *Nothofagus* groves where the rainfall is \pm 50" per annum but now much reduced through the effects of successive forest fires; absent from all other parts of Australia, but frequent in New Zealand south of the Bay of Islands, also on Chatham Id—one of the most extraordinary examples of disjunct distribution to be found in Australasia.

[The isolated, Victorian population is referable to var. *australiana* J. H. Willis in *Kew Bull.* 1939: 175 (1939), differing from the typical, New Zealand form in its *odourless* flowers, shorter (to 3 mm.) tubes in female flowers, rather larger perianth-segments and *more numerous* (5-12) smaller seeds.]

Tribe TOVARIEÆ (syn. Drymophileæ, ? Polygonateæ)

227. *DRYMOPHILA* R. Br. (1810)

713. *D. cyanocarpa* R. Br. *Prodr. Flor. Nov. Holl.* 292 (1810).

Illustr.: Williamson, *Vict. Nat.* 45: 8 fig. 5 (1928); Rodway, *Tasm. Flor.* t. inter 216 & 217 (1903); Comber, *Gdnrs' Chron.* ser. 3, 92: 242 fig. 119 (1932); Meredith, *Bush Friends Tasm.* t. 11, col. (1860).

Vern.: Turquoise Berry. *Distr.*: Distributed in moist forest-land throughout southern Victoria, from Portland district to Bendoc in the far east and from sea-level to the sub-alps, but rather uncommon (e.g. Grampians, Otways, Wombat Forest, Mt. Macedon, Kinglake Nat. Park, near Marysville, Tonimbuk, Upper Thomson R., Wilson Prom., Gelantipy, Goonmirk Range & Upper Delegate R.); also Tas., N.S.W. (as far north as Hastings R.).

Diagn.: Shade-loving perennial with leafy, simple or branched, arching stems to about 1 ft. high; leaves distichous, spreading, almost sessile, widely spaced, lanceolate, 1-3" long, 5-10 mm. wide at broadest part, \pm shining, with numerous prominent longitudinal nerves; flowers white, axillary, solitary or sometimes paired, usually on recurved pedicels 6-12 mm. long and only visible from under side of branch; perianth-segments 6, equal, free, lanceolate, widely spreading, 6-8 mm. long, 1.5-2 mm. wide, several-veined; anthers 6, oblong, \pm 1 mm. long, on slender filaments \pm 3 mm. long; styles 3, linear, recurved, \pm 2 mm. long; ovary sessile, ovoid, 2-3 mm. long, 3-locular with several ovules per loculus; fruit a bright-blue (rarely white), \pm globular, fleshy berry 7-10 mm. wide; seeds 8-20, smooth, \pm angular, brown, shining, 2-3 mm. long.

Tribe DIANELLEÆ

228. *DIANELLA* Lam. ex Juss. (1789)

1. Leaves radical, 15-25 mm. broad (when flattened out), 1-2 ft. long, distinctly *serrulate* along margins and keeled midrib, the lower narrowest part of blade Y-shaped in section; anther yellow, equal to or *shorter than* the swollen upper portion of filament; berry ovoid-oblong, >1 cm. long (plant 2-5 ft. high, in mountain-forests and shaded gullies):

714. *D. tasmanica* Hook. f. *Flor. Tasm.* 2: 57, t. 133, col. (1858).

Illustr.: Fitch in Hooker f. (*l.c.*); Fitch in *Curtis's bot. Mag.* 91: t. 5551, col. (1865); Williamson, *Vict. Nat.* 45: 38 fig. 4 (1928); Bishop in Barrett, *Sun Nature Book 1*: 35 fig. 7 (1932); Engler, *Natürl. PflFam.* ed. 2, 15a: fig. 111 (1930), also ed. 1, II 5: fig. 25 (1888).

Vern.: Tasman Flax-lily (Blueberry—Tas.). *Distr.*: Widespread in cooler, damp forest country of Victoria where often frequent, usually in sheltered situations and ascending into the alps (e.g. in such dispersed localities as Wannon R. Falls, Stony Rises near Colac, Otways, Mt. Macedon, Lerderdery Gorge,

Dandenongs, Kinglake Nat. Park, Baw Baws and sources of Yarra R., Lake Mountain, Howqua R., Mt. Skene, Mt. Buffalo, Barry Mts., Dargo High Plains, Bogong, Cobboras, Tom Groggin & Davey's High Plains, Goonmirk Range and many other montane parts of East Gippsland); also Tas., N.S.W.

—Leaves usually <15 mm. broad; anther much *longer than* swollen portion of filament; berry <1 cm. long

2. Leaf-blade with *strongly revolute* margins, Y-shaped in section at lower narrowest part, the midrib not serrulate; anthers *dark brown* or almost black (very widespread plant):

715. *D. revoluta* R. Br. Prodr. Flor. Nov. Holl. 280 (1810).

Illust.: Schlittler, *Monogr. Dianella* t. 28 (1940); Williamson, *Vict. Nat.* 45: 38 fig. 5 (1928); Ostenfeld, *Biol. Medd. Kbh.* 3^o: t. 1 (1921); Sulman, *Some Familiar Wild Flowers* t. 39 (1913); Charsley, *Wild Flowers Melb.* t. 12 fig. 3, col. (1867).

Vern.: Black-anther Flax-lily (Spreading Flax-lily). *Distr.*: Except on cultivated country, grassland and wetter forest areas, abundant almost throughout Victoria from the Far North-west and most sea-coasts to the alps; all Australian States.

—Leaf-blade *flat* or almost so, V-shaped in section at lower narrowest part; anthers *light yellow*

3. Leaves all *radical*, 6"-2 ft. long, often \pm glaucous, usually with *smooth* margins and midrib, the sheath *open* to its base; internodes *glabrous*; flowers pale bluish (widespread plant):

D. LONGIFOLIA VAR. *LONGIFOLIA*

716. *D. laevis* R. Br. Prodr. Flor. Nov. Holl. 280 (1810).

Illust.: Schlittler, *Monogr. Dianella* t. 27 (1940); Black, *Flor. S. Aust.* ed. 2: fig. 257 (1943); Forster in Harris, *Wild Flowers Aust.* t. 8, col. (1947); Williamson, *Vict. Nat.* 45: 38 fig. 6 (1928); Charsley, *Wild Flowers Melb.* t. 13 fig. 2, col. (1867), as "*D. longifolia*"; Hart in *Edwards' bot. Reg.* 9: t. 734, col. (1823), as "*D. longifolia*", also 13: t. 1120, col. (1828) as "*D. revoluta*"—except leaf.

Vern.: Pale Flax-lily (Smooth Flax-lily). *Distr.*: Widely distributed throughout western and north-eastern Victoria but seldom frequent (e.g. Kulkyn Nat. Forest, Big & Little Deserts, Murrayville, Warracknabeal, Poolaigelo, Lower Glenelg R., Portland, Hawkesdale, Ballarat, Brisbane Range, Keilor basalt plains, Frankston, Strathbogie, Nathalia), and fairly common in more open forest country of Gippsland (e.g. Tonimbuk & Pakenham, W Tree & Murrindal near Buchan); temperate parts of all States.

—Leaves \pm distichous, *on branching stems*, often only 3-6" long, *serrulate* (usually sharply) along margins and keeled midrib, the sheath *closed*; internodes \pm *velvety* (from a covering of minute papillate hairs); flowers bright-blue; berry often purple (eastern plant):

717. *D. caerulea* Sims in Curtis's bot. Mag. 15: t. 505, col. (1801).

D. laevis R. Br. var. *aspera* Benth. *Flor. aust.* 7: 15 (1878).

Illust.: Edwards in *Curtis's bot. Mag.* (l.c.); Alexander, *Addisonia* 18: t. 585 (1933); Cleveley in Banks & Solander, *Ill. aust. Plant. Cook's Voy.* 3: t. 304 (1905).

Vern.: Paroo Lily. *Distr.*: Widespread and locally common in eastern Victoria, on coastal heaths and more open forest of nearby ranges, but not known to the west of Melbourne (e.g. Yan Yean & Mt. Disappointment, Dandenongs, Launching Place to Cockatoo & Gembrook, Bunyip R., Moe, Wilson Prom., Buchan, Marlo, Tonghi plains & Reedy Ck near Cann R., Mt. Drummer, Mallacoota & Howe Hill); Tas. (northern parts & King Id), N.S.W., Qd, N. Terr. (Arnhem Land), W.A. (Kimberleys), Lord Howe Id.

229. STYPANDRA R. Br. (1810)

Plant tufted, with *leafless stems* 1-2 ft. high; leaves grass-like, 6-12" long; inflorescence wide-spreading, 6-12" long; flowers *erect*, the segments \pm 3 mm. broad; staminal filaments *covered* with small papillate hairs:

THELIONEMA CAESPITOSUM

718. *S. caespitosa* R. Br. *Prodr. Flor. Nov. Holl.* 279 (1810).

Illustr.: Lee, *Wild Life* 12: 202 (1950); Forster in Harris, *Wild Flowers Aust.* t. 42, col. (1947); Williamson, *Vict. Nat.* 45: 71 fig. 2 (1928); Mort in Sulman, *Wild Flowers N.S.W. I*: t. 50 fig. 1 (1913); Charsley, *Wild Flowers Melb.* t. 5 fig. 4, col. (1867).

Vern.: Tufted Blue-lily (Tufted Lily). *Distr.*: Widespread and not uncommon on damp coastal heaths of southern Victoria, from Portland district to Genoa R. (e.g. Otways, eastern Port Phillip Bay, whence now rapidly disappearing, Upper Beaconsfield, Quail Id, Wilson Prom., Woodside, Sale district, Cann R.), with isolated occurrences on swampy ground in more mountainous and inland situations (Grampians, Mt. Buffalo, Bidwell on Upper Delegate R.); Tas., N.S.W., Qd.

[Pale yellowish or almost white forms, both of this and the succeeding species, are known and recognition of the var. *alba* Ewart *Flor. Vict.* 292 (1931)—based on colour alone—seems unnecessary.]

Plant with creeping rootstock and *leafy stems* 1-4 ft. high; leaves *distichous*, 4-8" long, passing into broad leaf-like bracts at the inflorescence (3-6" long); flowers *nodding*, the segments $>$ 3 mm. broad; staminal filaments *glabrous* except for the large, dense, yellow hair-tuft under each anther:

719. *S. glauca* R. Br. *Prodr. Flor. Nov. Holl.* 279 (1810).

Illustr.: Curtis's *bot. Mag.* 62: t. 3417, col. (1835), as "*S. propinqua*"; Galbraith, *Wildflowers Vict.* t. 10 (1950); Williamson, *Vict. Nat.* 45: 71 fig. 1 (1928); Dickens in Pescott, *Native Flowers Vict.* t. opp. 91 (1914); Sulman, *Aust. Wild Flowers* ser. 2: t. 22 (1913).

Vern.: Nodding Blue-lily. *Distr.*: Except for the Mallee, alps, cultivated areas and grassland, a widespread and locally abundant plant on poor sandy or stony soils in many parts of Victoria, often increasing with successive fires (e.g. Lower Glenelg R., Dundas Range, Grampians, Mt. Arapiles, Mt. Cole, Terricks, Whipstick Scrub near Bendigo, Longwood, Warby Range, Beechworth, Cornishtown, Tolmie, Upper Murray R., Howe Range & Genoa R., Mt. Kaye, Bowen Range, Tambo R. below Nunniong Plateau, near Metung, Cobannah, Walhalla); S.A. (localized at Wudinna on Eyre Penins.), N.S.W., Qd, N. Cal.

Tribe UVULARIÆ

230. *SCHELHAMMERA R. Br. (1810)

720. *S. undulata* R. Br. *Prodr. Flor. Nov. Holl.* 274 (1810).

Illust.: Hooker in *Curtis's bot. Mag.* 54: 2712, col. (1827); Forster in Harris, *Wild Flowers Aust.* t. 11, col. (1947); Williamson, *Vict. Nat.* 45: 8 fig. 6 (1928); Hooker in Engler, *Natürl. PflFam.* ed. 2, 15a: fig. 91 D-H (1930), also ed. 1 II 5: 25 fig. 15 D-H (1888).

Vern.: Lilac Lily. *Distr.*: Restricted in Victoria to near-coastal forests of East Gippsland, usually in sandy and rather shaded situations but rather common east from Cann R. (e.g. Newton's Ck near Orbost, Bemm R., Wingan Inlet, Genoa Peak, Mallacoota, Howe Range); also N.S.W. (as far north as Newcastle).

Diagn.: Low, sometimes tuberous-rooted perennial with slender, weak, diffuse stems rarely more than 6" high; leaves few, sessile, glabrous, ovate to lanceolate, up to 2" long and to 0.5" wide, striated with several prominent veins and \pm delicately undulate along margins; flowers terminal, solitary or rarely 2 together, on erect pedicels \pm 1" long; perianth-segments 6, equal, free and soon deciduous, lilac or pale mauve, oblong, bluntish, 6-12 mm. long, 2-5 mm. wide, streaked with about 5 veins; anthers 6, purple, oblong, 1.5-2 mm. long, on thickish filaments 4-6 mm. long; style 3-4 mm. long, with 3 recurved stigmatic lobes each \pm 2 mm. long; ovary sessile, prominently 3-lobed and 3-locular with 4-6 ovules per loculus; capsule \pm fleshy, globular, but tapering below and flattened above, sprinkled with minute papillæ, 4-8 mm. high and wide; seeds usually 12 or more, brown, globular, \pm 2 mm. wide, with up to 16 vertical striæ, the funicle dilated into a broad irregular strophiole as long as seed.

Tribe *ASPARAGEÆ

231. *ASPARAGUS L. (1753)

Cladodes clustered, *capillary*; plant with rigidly *erect*, widely branching, feathery *annual shoots* 2-5 ft. high (fleshy and edible when very young):

721. **A. officinalis* L. *Spec. Plant* 1: 313 (1753).

Illust.: Bostelmann, *Nat. geogr. Mag.* 96: 178, col. (1949); Herter, *Flor. il. Uruguay* 1: fig. 886 (1943); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1035 (1931); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 10: t. 596, col. (1929); Javorka & Csapody, *Icon. Flor. Hungar.* 86 (1929); Bailey, *Standard Cycl. Hort.* new ed., 1: fig. 411, t. 12 (1925); Coste, *Flor. Franc.* 3: fig. 3493 (1906); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 63 fig. 1, col., also fig. 374 (1909); Reichenbach, *Icon. Flor. germ.* 10: t. 518, col. (1848).

Vern.: Asparagus. *Distr.*: Indigenous to Europe and western Asia, but original range uncertain owing to long and frequent cultivation; grown as a vegetable in many countries and sometimes escaping in sandy, often rather saline places—e.g. N. & S. Amer., N.Z. (Auckland), N.S.W., S.A. (Renmark irrigation district), and Victoria where noted as spontaneous along irrigation channels in the Red Cliffs & Mildura district (frequent), at St. Arnaud, Queenscliff, Melbourne area, Koo-Wee-Rup, Bairnsdale (common).

Cladode *solitary* in each leaf-scale, 2-3 cm. long, *leaf-like*, *ovate* and glossy; plant tall, *flexuose*, *climbing*:

722. **A. asparagoides* (L.) W. F. Wight in *Century Dict.* 11: 845 (1909).*Medeola asparagoides* L. *Spec. Plant.* 1: 339 (1753).

Illust.: Fitch in *Curtis's bot. Mag.* 92: t. 5584, col. (1866), as "*Myrsiphyllum asparagoides*"; Herter, *Flor. il. Uruguay* 1: fig. 889 (1943), as "*A. medeoloides*"; Joyeux, *Mém. Acad. R. Belg. Cl. Sci.* 8vo., 10⁶: t. 8-10 (1929), as "*A. medeoloides*"; Bailey, *Standard Cycl. Hort.* new ed., 1: fig. 410 (1925); Smith in Marloth, *Flor. S. Afr.* 4: t. 20 fig. F, col. (1915), as "*A. medeoloides*"; Redouté, *Liliacées* 8: t. 442, col. (1816), as "*Medeola asparagoides*".

Vern.: *Smilax Asparagus* (Wreath-vine, *Smilax*—of florists). *Distr.*: Indigenous to South Africa; introduced for ornament into gardens throughout the world, and escaping in many places—e.g. S. Amer., S.A. (Goolwa, Tod R.), and Victoria where established in a few sandy, coastal habitats (Torquay, Queens-cliff, St. Leonards, Frankston, Deep Ck at Bulla, Lakes Entrance).

[The South African *A. plumosus* J. G. Baker (Fern *Asparagus*) is frequently grown as a decorative climber, and its fronds are much used in floral art. Its capillary cladodes spread fan-wise in one plane, so that major branches resemble flattened, lacy fern-fronds. Seeds from the small black berries may be carried by birds, and the tough perennial vines tend to persist in old gardens.]

Tribe ANGUILLARIÆ

232. ANGUILLARIA R. Br. (1810)

723. *A. dioica* R. Br. *Prodr. Flor. Nov. Holl.* 273 (1810).

Illust.: Speck in Blackall, *How to Know W. Aust. Wildflowers* t. 1 opp. 64, col. (1954), as "*Wurmbea dioica*"; Forster in Harris, *Wild Flowers Aust.* t. 4, col. (1947); Black, *Flor. S. Aust.* ed. 2: fig. 259 (1943); Bishop in *Wild Life* 2: 27 (June 1940), also 2: 12 (Sept. 1940) and 5: 267 (1943); Lee, *Wild Life* 8: 394 (1946); *l.c.* 14: 213 (1951); Elford, *Wild Life* 16: 173 (1952); Ewart, *Flor. Vict.* fig. 144 (1931); Williamson, *Vict. Nat.* 45: 8 fig. 8 (1928); Ewart, *Plant. indig. Vict.* t. 82 opp. 19 (1910); Mueller, *Key Syst. Vict. Plant.* 2: fig. 118 (1886), as "*Wurmbea dioica*"; Charsley, *Wild Flowers Melb.* t. 11 fig. 5, col. (1867); Meredith, *Bush Friends Tasm.* t. 6, col. (1860); Bauer in Endlicher, *Icon. Gen. Plant.* t. 3 (1838).

Vern.: Early Nancy (Harbinger-of-spring, Blackman's Potatoes—Tas.). *Distr.*: Widespread and abundant almost throughout western and north-eastern Victoria, favouring open grassy places and moist flats (e.g. Far & Extreme North-west, Big & Little Deserts, Grampians, Lower Glenelg R., Donald, St. Arnaud, Ballarat, Port Fairy, Bellarine Penins., Port Phillip, Dandenongs, Tallarook, St. James, Rushworth, Nathalia, Wodonga), but rather uncommon in East Gippsland (on open grassland around settlements) and absent from high mountainous tracts; all States, Cent. Aust.

Diagn.: Small renascent perennial herb with black bulbous rootstock; leaves few, glabrous, the lowest reduced to elongated brownish sheaths, the upper 2-4 (on stem) lanceolate to linear, with dilated and loosely sheathing bases, usually to 4" long (seldom to 8"), 5-10 mm. wide at sheath, almost filiform above; flowers honey-scented, variously polygamous or dioecious, sessile, 1-8 (rarely more), \pm widely spaced on a flexuose axis 1-10" long; perianth white or pale-greenish, usually with a broad purple ring or band of colour toward base; segments 6, equal, free, persistent, oblong to linear, 6-12 mm. long, 1.5-3 mm. wide; anthers 6, broad, \pm 1 mm. long, versatile on \pm flattened filaments 3-4

mm. long; styles 3, free, ± 1.5 mm. long; ovary sessile, 2-3 mm. long, barrel-shaped, 3-locular with several ovules per loculus; capsule 6-10 mm. long, ovate to oblong, thinly coriaceous; seeds several, nigger-brown, globular, shining, \pm rugulose, 1.5-2 mm. in diameter.

Tribe BURCHARDIÆ (? syn. *Iphigeniæ*)

233. BURCHARDIA R. Br. (1810)

724. *B. umbellata* R. Br. *Prodr. Flor. Nov. Holl.* 273 (1810).

Illust.: Galbraith, *Wildflowers Vict.* t. 5 (1950); Black, *Flor. S. Aust.* ed. 2: fig. 258 (1943), as "*Reya umbellata*"; Forster in Harris, *Wild Flowers Aust.* t. 57, col. (1947); Bishop in Barrett, *Aust. Wildflower Book* 65 (1942); Bishop, *Wild Life* 2: 25 (Sept. 1940); Lee, *Wild Life* 12: 202 (1950); Elford, *Wild Life* 16: 174 (1952); Ewart, *Flor. Vict.* fig. 145 (1931); Williamson, *Vict. Nat.* 45: 8 fig. 7 (1928); Sulman, *Aust. Wild Flowers* ser. 2: t. 44 (1913); Charsley, *Wild Flowers, Melb.* t. 5 fig. 3, col. (1867); Meredith, *Bush Friends Tasm.* t. 6, col. (1860).

Vern.: Milkmaids (Star-of-Bethlehem). *Distr.*: Except on agricultural land, the Mallee, alps and wetter forest areas, very widespread and frequent throughout open forest, grassland and heath in many parts of Victoria (e.g. Little Desert, Grampians, Lower Glenelg, Portland, Hawkesdale, Ararat, St. Arnaud, Creswick, Brisbane Range, Otways, Port Phillip, Dandenongs, Tallarook, Alexandra, Warby Range, Beechworth, Wodonga, Howe Range, Wingan Inlet, Cann R., Bruthen, Stratford, Wilson Prom.); all Australian States.

Diagn.: Renascent perennial herb with short fibrous rootstock; leaves few, glabrous, linear, grass-like, sheathing at base, 3-18" long (usually ± 6 "), 4-8 mm. wide; flowering stem 6-24" high, simple or sometimes with 1-2 branches, bearing a terminal umbel of several (2-10), fragrant flowers on erect or spreading pedicels 1-2 cm. long, the whole subtended by an equal number of small, linear, involucre bracts 5-10 mm. long; perianth-segments 6, white or with rosy-red external tints, equal, free, deciduous, oblong to elliptic, 6-12 mm. long, 2-5 mm. wide; anthers 6, versatile, narrow-oblong, rosy-red, 2-3 mm. long, the filaments ± 5 mm. long and flattened out toward base; style very short, with 3 rigid, slightly recurved stigmatic arms ± 1 mm. long; ovary fusiform, 4-6 mm. long, prominently 3-angled, 3-locular with numerous ovules in each loculus; capsule toughly coriaceous, 10-15 mm. long, strongly 3-angled, narrowly ovoid to oblong, beaked, the sharp valves \pm recurving upon dehiscence; seeds numerous, brown, irregularly angular, minutely granular, 1.5-2.5 mm. long.

Tribe PHILESIÆ (syn. *Eustrepheæ*)

234. GEITONOPLESIMUM A. Cunn. (1832)

725. *G. cymosum* (R. Br.) A. Cunn in *Curtis's bot. Mag.* 59: t. 3131, col. (1832).
Luzuriaga cymosa R. Br. *Prodr. Flor. Nov. Holl.* 282 (1810).

Illust.: Curtis (*l.c.*); Forster in Harris, *Wild Flowers Aust.* t. 63, col. (1947); Williamson, *Vict. Nat.* 45: 8 fig. 4 (1928); Baillon, *Hist. Plant.* 12: fig. 446 (1894).

Vern.: Scrambling Lily (Shepherd's Joy). *Distr.*: Restricted in Victoria to near-coastal jungles of East Gippsland, but widespread therein and not uncommon from Deadcock Ck and Mitchell R. gorges near Glenaladale to the Howe Range (e.g. Lakes Entrance, Lower Brodribb R., Cann R.); N.S.W., Qd, N. Cal.

Diagn.: Tall, glabrous, much-branched climber with wiry twining stems, the axis of young branchlets flexuose and with broadish scales (± 5 mm. long) at base of each; leaves distichous, rather remote, alternate, ovate-lanceolate to linear, 1-3" long, $\pm 3-5$ mm. wide, streaked with many fine parallel nerves and slightly paler beneath, the base sharply contracted into a short petiole ± 1 mm. long; flowers creamy-white, green or purplish, terminal, 4-8 together in drooping cymes, the filiform pedicels 3-7 mm. long; perianth-segments 6, free but not spreading, 5-8 mm. long, 1.5-2.5 mm. wide, the inner slightly more delicate and shorter than outer; anthers 6, erect, yellow, 3-4 mm. long on much shorter filaments (1-2 mm.); style simple, filiform, slightly exceeding anthers; ovary globular, green, 1-2 mm. wide, 3-locular, with several ovules per loculus; fruit shining, berry-like, dark blue to black, few-seeded, sometimes tardily opening by 3 valves, 6-12 mm. in diameter; seeds black, irregularly angular or grape-seed-like, with rounded faces, 3-5 mm. long, 2-3 mm. wide.

235. *EUSTREPHUS* R. Br. (1810)

726. *E. latifolius* R. Br. *Prodr. Flor. Nov. Holl.* 281 (1810).

Illust.: Edwards in *Curtis's bot. Mag.* 31: t. 1245, col. (1809); Galbraith, *Wild-flowers Vict.* t. 9 (1950); Williamson, *Vict. Nat.* 45: 8 fig. 3 (1928); Jarman, *Aust. Plant. Drawings* 91-92 (1930); Sulman, *Some Familiar Wild Flowers* t. 38 (1913); Miller in Banks & Solander, *Ill. aust. Plant. Cook's Voy.* 3: t. 305-306 (1905); Bauer in Endlicher, *Icon. Gen. Plant.* t. 4 (1838).

Vern.: Wombat Berry (Orange-vine). *Distr.*: Restricted in Victoria to near-coastal jungles of East Gippsland where locally frequent, from Deadcock Ck and Mitchell R. gorges near Glenaladale to the Howe Range (e.g. Fairy Dell near Bruthen, Lakes Entrance, Lower Brodribb R., Wingan Inlet, Mt. Drummer); N.S.W., Qd, N. Cal.

Diagn.: Tall, glabrous, much-branched climber with weak, flexuose but non-twining stems; leaves distant, alternate, \pm distichous, virtually sessile, from broadly ovate-lanceolate to almost linear, 1-4" long, 1-3 cm. wide at broadest middle portion, firm-textured, \pm lustrous, with many prominent, fine longitudinal veins, the margins sometimes slightly undulate; flowers creamy or pink, in clusters of 2-10 (usually 4-6) in the upper axils, each articulate on a long-persistent, erect or spreading pedicel 10-16 mm. long; perianth-segments 6, free, the outer $\pm 5-7 \times 1.5-2.5$ mm. and tending to reflex, the inner 3 more delicate, narrower and \pm fringed with hair along margins; anthers 6, \pm cohering, 3-5 mm. long, on short filaments of variable length (but whole stamen almost equalling length of perianth); style simple, filiform, 4-7 mm. long; ovary short, 3-locular, sessile, with several ovules per loculus; fruit berry-like, bright orange, globular, 8-13 mm. in diameter, tardily opening by 3 valves; seeds 3-12, almost globular or slightly irregular, black, \pm lustrous, 2.5-4 mm. wide.

Tribe SMILACEÆ

236. *RIPOGONUM* Forst. & Forst. f. (1776)

727. *R. album* R. Br. *Prodr. Flor. Nov. Holl.* 293 (1810).

Illust.: Williamson, *Vict. Nat.* 45: 8 fig. 2 (1928); Krause in Engler, *Natürl. PflFam.* ed. 2, 15a: 382 fig. 158 (1930).

Vern.: White Supplejack. *Distr.*: Confined in Victoria to a few near-coastal jungles of East Gippsland, but very localized (Lower Brodribb R. & Lockend near mouth of Snowy R., Wingan R., Harrison's Ck. in Howe Range); N.S.W., Qd, ?W.A. (Kimberleys).

Diagn.: Tall, glabrous climber, the principal branches sometimes bearing prickles; leaves alternate, irregularly opposite or sometimes ternate, leathery, oblong-elliptic, 2-5" long, up to 2" wide, strongly reticulate between the 3-5 prominent longitudinal nerves, sharply contracted into a twisted petiole 10-15 mm. long; flowers bisexual, rather distantly spaced on stout pedicels 2-5 mm. long, in simple, axillary, 6- to 12-flowered racemes 1-4' long; perianth-segments 6, \pm equal, deciduous, widely spreading or slightly reflexed, 6-10 mm. long, 2-3 mm. wide, whitish, the whole rather fragrant; anthers 4-6 mm. long, slightly pruinose, on stout filaments 1-2 mm. long; ovary sessile, pyriform, 3-4 mm. long, tapering into a very short style with 3 thick recurving stigmatic lobes, 3-locular, 3-ovulate; fruit subtended by 2-4 small persistent floral bracts, berry-like, reddish-purple, drying black, 6-10 mm. in diameter, tardily opening by 3 fleshy irregular valves; seeds 1-3, brown, 3-5 mm. wide, \pm globular, with thin wrinkled testa.

237. SMILAX L. (1753)

728. *S. australis* R. Br. *Prodr. Flor. Nov. Holl.* 293 (1810).

Illustr.: Williamson, *Vict. Nat.* 45: 8 fig. 1 (1928); Ewart, *Plant. indig. Vict.* t. 95 opp. 32 (1910); Mueller, *Key Syst. Vict. Plant.* 2: fig. 117 (1886).

Vern.: Austral Sarsaparilla (Lawyer-vine). *Distr.*: In Victoria restricted to East Gippsland where a frequent component of near-coastal jungles (e.g. Deadcock Ck & Mitchell R. gorges near Glenaladale, Fairy Dell near Bruthen, Lakes Entrance, Lower Brodribb R., Mt. Drummer, Howe Range), but sometimes intruding into mountain-forests (as at Mts. Ellery & Kaye); N.S.W., Qd, N. Terr. (north coast).

Diagn.: Tall, rank, much-branched, glabrous climber, \pm armed with small scattered prickles, the younger branches slightly angular; leaves alternate, broadly oblong-lanceolate to ovate or almost orbicular, usually 2-4" long, 1-3" wide, traversed by 5 bold distant rib-like nerves, with prominent reticulate inter-venation, sharply contracted into a twisted petiole 5-15 mm. long, very leathery in texture; petiole usually, but not always, furnished with a simple tendril (to 2" long) on each side; flowers unisexual, on pedicels 4-12 mm. long, borne 15-50 together in shortly pedunculate axillary umbels 1-4 cm. wide, the male and female in separate inflorescences (? on different plants); male and female perianth similar, the 6 narrowly oblong, white or purplish, spreading, free and \pm equal segments 3-5 \times 1-1.5 mm.; anthers 6, oblong, 0.5-1 mm. long, at length \pm arcuate, on slender filaments 2-4 mm. long; ovary sessile, pyriform, 2-3 mm. long, narrowed into a very short style with 3 recurving stigmatic arms (0.5 mm. long), 3-locular, 3-ovulate; fruit a black, shining, globular berry 8-12 mm. in diameter, on firm stalk \pm 1 cm. long; seeds 1-3, globular when single, \pm flattened on inner faces when 2 or 3, lustrous, \pm 5 mm. high and wide, the testa minutely and finely rugulose.

[Several other members of *Liliaceæ*, in the exotic tribes *Aloineæ* and *Hyacintheæ* (syn. *Scilleæ*), are occasional garden escapes in various parts of Victoria. The two South African aloes, *Aloë arborescens* Mill. and *A. latifolia* Haw., are familiar on railway embankments and rockeries in the Melbourne area, both tending to persist: the latter has relatively broad, somewhat reddish, white-mottled, radical leaves and very short broad racemes (terminating scapes 1-2 ft. high) with dull red or pinkish flowers, the former being much taller and densely shrubby (4-8 ft. high) with narrow, recurved, glaucous leaves and bright red flowers in long dense racemes.

European *Muscari conicum* (Jord. & Fourr.) J. G. Baker (Grape Hyacinth) increases rapidly in gardens and is sometimes spontaneous in lanes and on vacant

allotments around towns; it has been noted about Melbourne and at Sale. The less common Grape Hyacinth, *M. botryoides* (L.) Mill., was found growing spontaneously along a road at Somerville (Sept. 1916); it differs from *M. conicum* in the more globular, paler blue flower-bells and broader, less flaccid leaves. The Spanish Bluebell or Wild Hyacinth, *Endymion hispanicus* (Mill.) Chouard, also propagates readily from bulbs and persists in places; flowers are loosely arranged and more or less erect on raceme, each perianth 1-2 cm. long, the anthers blue. Several South African species of *Ornithogalum*—notably *O. caudatum* Ait. with small greenish flowers in elongated racemes, larger-flowered white *O. lacteum* N. J. Jacq. and *O. thyrsoides* N. J. Jacq. ("Chincherinchees")—are frequently grown in Victoria and sometimes escape from gardens; *O. thyrsoides* is recorded as naturalized in South Australia, while the European *O. umbellatum* L. ("Star of Bethlehem"), with narrow green-banded floral segments, is also a casual escape from Victorian gardens.]

Family 55. *AGAVACEÆ

238. *AGAVE L. (1753)

729. *A. americana L. *Spec. Plant.* 1: 323 (1753).

Illust.: Fitch in *Curtis's bot. Mag.* 65: t. 3654, col. (1838); Black, *Flor. S. Aust.* ed. 2: fig. 282 (1943); Hylander, *World Plant Life* 570 (1945); Ruff in Bailey, *Manual cult. Plant.* rev. ed.: fig. 34 (1949); Featherstone, *Gdnrs' Chron.* ser. 3, 127: 43 fig. 19 (1950); *J. N.Y. bot. Gdn.* 11: t. 79 (1910); *Plant World* 11: 143, 145 (1908); Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 414 (1909); Reichenbach, *Icon. Flor. germ.* 9: t. 374, col. (1847).

Vern.: Century Plant (American Aloe). *Distr.*: Origin uncertain, but probably from Mexico; now widely planted (for hedges and ornament) throughout warm and dry parts of world, and naturalized along Mediterranean coasts, in S.A. and parts of Victoria (drier western and north-eastern districts, usually around old homesteads).

Diagn.: Plant with immense basal rosette of thick, fleshy, bluish, lanceolate spine-tipped leaves 3-6 ft. long; inflorescence massive, 15-30 ft. high, with terminal candelabra-like panicle of yellowish tubular flowers, appearing only after long intervals (20 years or more), the rosette dying after anthesis and replaced by several small lateral rosettes; perianth (with ovary) \pm 3" long, the 6 stamens exceeding it by 1-2"; anthers crescentic, versatile, \pm 2 cm. long; capsule oblong, \pm 2" long, 3-locular, with numerous flat black seeds.

[The New Zealand Flax, *Phormium tenax* Forst. & Forst. f., has generally been placed under *Liliaceæ*; but J. Hutchinson, in *Families of Flowering Plants* 2 (*Monocotyledons*): 153 (1944), assigns it to the family *Agavaceæ*. A stout rhizomic plant having tough erect leaves 3-9 ft. long, scapes of 5-15 ft. and dark paniculate flowers with superior ovaries, *P. tenax* occurs in many forms in New Zealand, thrives on swampy land and has long been cultivated in Victoria, both for ornament and its valuable commercial fibre. It tends to persist around lakes (e.g. at Emerald) and ornamental garden ponds.]

Family 56. AMARYLLIDACEÆ

1. Ovary inferior 4
Ovary superior 2
2. Rootstock a rhizome; leaves perennial forming large tufts; flowers numerous in an umbel 4-8" wide; perianth 1-2" long, white or blue (garden plant) **Agapanthus* (p. 327)

- Rootstock a *bulb* or *corm*; leaves *annual*; umbel <4" wide; perianth <1" long (or, if >1", then flower solitary) 3
3. Leaves with *garlic odour* when bruised; flower *solitary*, relatively large; perianth-segments *united* below in a tube; stamens alternately *long and short* **Ipheion* (p. 327)
- Leaves with *garlic odour*; flowers *several to many* per umbel, small; perianth-segments *free*; stamens *equal* 239. **Allium*
- As for the last, but leaves *odourless* and perianth-segments *united* toward base 240. **Nothoscordum*
4. Perianth with a *distinct corona* 7
- Perianth *without* a corona 5
5. Perianth-tube *very long* (2-4"); lobes >1" long (plant of Far North-west; flowers umbellate, whitish, scented) 241. *Crinum*
- Perianth-tube *absent* or very short (escaped garden flowers) 6
6. Flowers 1-4 together (rarely more), on *flattened* scapes, *nodding*, bell-like, almost *odourless*; perianth-segments <1" long, white and *tipped with green* (leaves strap-like) **Leucojum* (p. 327)
- Flowers *several* in a *leafy umbel*, *erect*, odourless; perianth-segments clawed, 1-2" long, green or *orange-coloured*, at least the inner 3 streaked and dotted with brown (leaves thin, \pm glaucous, lanceolate to oblanceolate, 3-5" long; capsule flat-topped and vertically ribbed) **Alstræmeria* (p. 327)
- Flowers *several* per umbel on a long, *stout*, *terete* scape (appearing in summer, *before* the strap-like leaves), *erect*, *highly fragrant*; perianth-segments >2" long, usually pink **Amaryllis* (p. 327)
7. Corona consisting of the much-expanded, petaloid and *connate staminal filaments*; ovary 1-locular (plant of Far North-west) 242. *Calostemma*
- Corona independent of and surrounding the stamens; ovary 3-locular (garden escapes) **Narcissus* (p. 327)

239. **ALLIUM* L. (1753)

1. Scape *3-angled*; leaves \pm *flat*; flowers 10-15 mm. long, *white*, *nodding*, few in a loose umbel (filaments entire):

730. **A. triquetrum* L. *Spec. Plant.* 1: 300 (1753).

Illust.: Edwards in *Curtis's bot. Mag.* 22: t. 869, col. (1805); Cant in Angove, *J. Dep. Agric. S. Aust.* 49: t. opp. 390, col. (1946); Adams in Connor, *Bull. Dep. sci. industr. Res.*, N.Z. 99: fig. 36 A-C (1951), also Zotov in Allan *l.c.* 83: fig. 90 (1940); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1055 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 10: t. 584, col. (1929); Coste, *Flor. Franc.* 3: fig. 3460 (1906); Reichenbach, *Icon. Flor. germ.* 10: t. 503 fig. 1101, col. (1848).

Vern.: Three-cornered Garlic (Triquetrous Garlic, Triquetrous Leek, Angled Onion). *Distr.*: Indigenous to the western Mediterranean; introduced into Britain, N.Z., S.A. (Mt. Lofty Range) and Victoria, where a proclaimed noxious weed for the whole State, but of scattered distribution and favouring moist shady places (e.g. railway cuttings in Melbourne suburban area)—noted at Portland, Horsham, Yarra Bend Nat. Park etc.

—Scape *terete*, rather slender; leaves *flat*; flowers 8-10 mm. long, *pure-white*, numerous (>15) in a spreading umbel (filaments entire):

731. **A. neapolitanum* Cyrillo *Plant. rar. Neap. 1: 13, t. 4, col. (1788).*

Illustr.: Cyrillo (*l.c.*); *Curtis's bot. Mag.* 63: t. 3531, *col.* (1836), as "*A. cowani*"; Koppel, *Flor. Israel* [t. 107] (1956); Herter, *Flor. il. Uruguay 1: fig. 851 (1943)*; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg. 10: t. 583, col. (1929)*; Bailey, *Standard Cycl. Hort.* new ed., 1: fig. 158 (1925); Coste, *Flor. Franc. 3: fig. 3459 (1906)*; *J. roy. hort. Soc.* 16: 99 (1894); Reichenbach, *Icon. Flor. germ. 10: t. 507 fig. 1108, col. (1848).*

Vern.: Naples Onion. *Distr.*: Indigenous to Mediterranean region; introduced as a garden flower to many countries, and now run wild to a limited extent in or around settlements of S. Amer., S.A. (Mt. Gambier) and Victoria—Byaduk, Nhill, Dimboola, Stawell, Bendigo, Dunolly, Melbourne district etc.

—As for the last, but the reddish-purple flowers (5-8 mm. long) few and the inner staminal filaments bearing 3 long apical points (the middle one antheriferous):

732. **A. scorodoprasum* L. *Spec. Plant. 1: 297 (1753).*

Illustr.: Herter, *Flor. il. Uruguay 1: fig. 843 (1943)*; Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1049 (1931); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg. 10: t. 582, col. (1929)*; Javorka & Csapody, *Icon. Flor. Hungar. 77 (1929)*; Hegi, *Ill. Flor. Mittel-Eur. 2: fig. 334 (1909)*; Coste, *Flor. Franc. 3: fig. 3449 (1906)*; Reichenbach, *Icon. Flor. germ. 10: t. 490 fig. 1073, col. (1848).*

Vern.: Sand Leek (Giant Garlic). *Distr.*: Indigenous to Europe and Asia Minor; introduced into S. Amer., S.A. (Inman R.) and Victoria, where a scattered and occasional weed (Maryborough, Bendigo, Dunolly, Seymour, Greenvale, Geelong, Warragul).

—Scape terete; leaves \pm cylindrical, hollow

2

2. Inflorescence of bulbils only

6

Inflorescence with normal flowers

3

3. Leaves robust, >5 mm. wide; scape inflated; flowers very numerous, greenish-white (filaments \pm entire):

733. **A. cepa* L. *Spec. Plant. 1: 300 (1753).*

Illustr.: Edwards in *Curtis's bot. Mag.* 36: t. 1469, *col.* (1812); Bostelmann, *Nat. geogr. Mag.* 96: 203, *col.* (1949); Herter, *Flor. il. Uruguay 1: fig. 849 (1943)*; Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg. 10: t. 580-581, col. (1929)*; Javorka & Csapody, *Icon. Flor. Hungar. 79 (1929)*; F.K. in Hegi, *Ill. Flor. Mittel-Eur. 2: fig. 351 (1909)*; Coste, *Flor. Franc. 3: fig. 3431 (1906)*; Reichenbach, *Icon. Flor. germ. 10: t. 494 fig. 1083, col. (1848).*

Vern.: Onion (Garden Onion). *Distr.*: Long-cultivated, and place of origin unknown, but probably Central Asia; widely grown as a crop in many countries and, although hardly naturalized in Victoria, tending to persist by unharvested bulbs in home gardens and onion farms (e.g. Colac district).

[Proliferous forms are known, and the variety *ascalonicum* (L.) DC. is shallot—a perennial, with non-inflated scapes.]

—Leaves almost filiform, 1-3 mm. wide; scape not inflated

4

4. Umbel of numerous, bright pink flowers 7-12 mm. long (on pedicels 5-8 mm.), without bulbils; stamens enclosed, the filaments entire:

734. **A. schænoprasum* L. *Spec. Plant.* 1: 301 (1753).

Illust.: Edwards in *Curtis's bot. Mag.* 28: t. 1141, col. (1808); Herter, *Flor. il. Uruguay* 1: fig. 847 (1943); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1051 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 10: t. 585, col. (1929); Javorka & Csapody, *Icon. Flor. Hungar.* 79 (1929); Thompson, *Sub-alpine Plant.* t. 15 (1912); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 60 fig. 2, col. (1909); Coste, *Flor. Franc.* 3: fig. 3434 (1906); Reichenbach, *Icon. Flor. germ.* 10: t. 496 fig. 1085, col. (1848).

Vern.: Chives. *Distr.*: Indigenous to Europe, northern Asia and North America; widely cultivated as a culinary flavouring, and occasionally escaping from gardens in Victoria (e.g. Geelong, Kyneton, Oaklands Junction).

—Umbel of numerous, reddish-purple flowers \pm 5 mm. long, without bulbils; stamens exerted, each filament with 3 long apical points:

735. **A. sphærocephalon* L. *Spec. Plant.* 1: 297 (1753).

Illust.: *Curtis's bot. Mag.* 42: t. 1764, col. (1815); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1052 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 10: t. 583, col. (1929); Javorka & Csapody, *Icon. Flor. Hungar.* 77 (1929); Avebury, *Notes Life Hist. Brit. Flor.* t. 421 (1905); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 60 fig. 1, col. (1909); Coste, *Flor. Franc.* 3: fig. 3436 (1906); Reichenbach, *Icon. Flor. germ.* 10: t. 492 fig. 1080, col. (1848).

Vern.: Round-headed Leek (Round-headed Garlic, Round-headed Allium, Ball-head Onion). *Distr.*: Indigenous to Europe; a casual introduction into Victoria (e.g. Warrnambool, 1914) and apparently not spreading.

—Umbel of few, pale pink or greenish-white flowers \pm 5 mm. long, usually interspersed with bulbils

5. Spathe 1-valved, scarious, with beak hardly exceeding flowers; stamens exerted, each inner filament with 2 lateral points longer than anther:

736. **A. vineale* L. *Spec. Plant.* 1: 299 (1753).

Illust.: Cant in Angove, *J. Dep. Agric. S. Aust.* 49: 385 (1946); Allan, *Bull. Dep. sci. industr. Res., N.Z.* 83: 219 fig. P (1940); Gleason, *New Britton & Brown Ill. Flor. N.E. United States & Canada* 1: 414 (1952); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1053 (1931); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 10: t. 583, col. (1929); Javorka & Csapody, *Icon. Flor. Hungar.* 77 (1929); Brenchley, *Weeds Farm Land* 113 (1920); Long, *Common Weeds Farm & Garden* 210 t. 3 (1910); Hegi, *Ill. Flor. Mittel-Eur.* 2: fig. 336 (1909); Coste, *Flor. Franc.* 3: fig. 3435 (1906); Reichenbach, *Icon. Flor. germ.* 10: t. 490 fig. 1075, col. (1848).

Vern.: Crow Garlic. *Distr.*: Indigenous to Europe, North Africa and Asia Minor; introduced into N. Amer., N.Z. (Auckland region), N.S.W., S.A. and Victoria, where a scattered but increasing weed on heavier soils in western districts (Dimboola, Hamilton, Port Fairy, Bendigo, Kyneton, near Clunes, Buninyong, Geelong, Werribee).

[The var. *compactum* (Thuill., *ut sp.*) Lejeune & Courtois, *Compend. Flor. belg.* 2: 15 (1831), in which all the flowers are replaced by bulbils, would seem to be the only form of the species occurring spontaneously in Victoria.]

—Spathe 2-valved, produced into leaf-like points very much longer than flowers; stamens enclosed in perianth, the filaments all entire or nearly so:

737. **A. oleraceum* L. *Spec. Plant.* 1: 299 (1753).

Illust.: Gleason, *New Britton & Brown Ill. Flor. N.E. United States & Canada* 1: 416 (1952); Fitch, *Ill. Brit. Flor.* ed. 5: fig. 1050 (1931); Poinset in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 10: t. 585, col. (1929); Javorka & Csapody, *Icon. Flor. Hungar.* 81 (1929); Heukels, *Flor. nederl.* 1: 276 (1910); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 60 fig. 6, col. (1909); Coste, *Flor. Franc.* 3: fig. 3437 (1906); Schnizlein, *Icon. Fam. nat. Regn. veg.* 1: t. 55, col. (1849); Reichenbach, *Icon. Flor. germ.* 10: t. 487 fig. 1067, col. (1848).

Vern.: Field Garlic (Pot-herb Onion). *Distr.*: Indigenous to Europe; introduced into N. Amer. and Victoria, where an occasional weed on agricultural land (e.g. Port Fairy & Kirkstall district, Broadford), but perhaps overlooked from its close resemblance to the commoner *A. vineale*.

6. Spathe 1-valved, scarious, *not* or hardly longer than inflorescence:

**A. vineale* L. var. *compactum* (Thuill.) Lejeune & Courtois [*See* No. 736].

—Spathe 2-valved, with leaf-like points *far exceeding* inflorescence:

**A. oleraceum* L.—a rare form [*See* No. 737].

[Asiatic *A. sativum* L. (Garlic) has flat leaves and small whitish flowers intermixed with bulbils; it is an occasional garden escape in Victoria. The southern European *A. porrum* L. (Leek) is sometimes cultivated as a vegetable; it is closely related to and perhaps derived from the Wild Leek (*A. ampeloprasum* L.).]

240. **NOTHOSCORDUM* Kunth (1843)738. **N. inodorum* (Ait.) G. Nicholson *Ill. Dict. Gardening* 2: 457 (1885).

Allium inodorum Ait. *Hort. kew.* 1: 427 (1789);

N. fragrans (Vent., ut *Allium* sp.) Kunth *Enum. Plant.* 4: 461 (1843).

Illust.: Edwards in *Curtis's bot. Mag.* 28: t. 1129, col. (1808), as "*Allium inodorum*"; Wills in Whittet, *Weeds* (N.S.W. Dep. Agric.) fig. 88 (1958); Wills in Maiden, *Weeds N.S.W.* 39 (1920), as "*Allium fragrans*"; Bailey, *Qd agric. J.* 5: t. 151 (1899), as "*N. fragrans*"; Small, *Addisonia* 13: t. 433 (1928), as "*N. fragrans*"; Koorders, *Excursionsflor. Java* 4³: 230 (1923), as "*N. fragrans*"; Britton, *Flor. Bermuda* 70 (1918), as "*N. fragrans*".

Vern.: Fragrant False-garlic (Wild Onion). *Distr.*: Original habitat uncertain, but probably subtropical or Andean regions of America; now introduced as a weed in many countries, viz. N. Amer., Indonesia, parts of Europe, N. Afr., Qd, N.S.W. and Victoria where not uncommon locally as a weed of cultivation in western districts (e.g. Melbourne area, Meredith, Timboon, Bendigo, Warracknabeal, Dimboola).

Diagn.: Bulbous, renascent perennial with \pm fleshy roots; bulb globose, 1-2 cm. wide, white smooth-coated; leaves basal, linear, 6-18" long, 4-10 mm. wide; scape terete, 1-2 ft. high, bearing a terminal umbel of 8-20 (usually \pm 12) white and fragrant flowers subtended by 2 connate, broadly ovate papery bracts \pm 1 cm. long; perianth on slender pedicel 1-3 cm. long, the 6 lobes \pm equal, shortly united at base or at last free, obtuse, broadly oblanceolate-oblong, 10-15 \times 3-5 mm.; anthers 6, broad, versatile, \pm 1 mm. long, on free, tapering, very flattened filaments (to 10 mm. long and 1-1.5 mm. wide at base); style slender, 3-6 mm. long, with small capitate stigma; ovary 3-4 mm. long,

sessile, broadly ellipsoid, flattened above, 3-locular and bluntly 3-lobed, with several ovules per loculus; capsule similar to ovary but larger (5-8 mm. long); seeds several, black, sharply and irregularly angular, ± 2 mm. long, with minutely wrinkled testa.

241. CRINUM L. (1753)

739. *C. flaccidum* Herb. in *Curtis's bot. Mag.* 47: sub t. 2121, p. 7 (1820).

Illust.: *Curtis's bot. Mag.* 47: t. 2133, col. (1820); Forster in Harris, *Wild Flowers Aust.* t. 60, col. (1947); Mahood in Chippendale, *Poison. Plant. N. Terr.* Pt. 2: 19 t. 2 (1958); Black, *Flor. S. Aust.* ed. 2: fig. 279 (1943); Williamson, *Vict. Nat.* 45: 162 fig. 6 (1926); MacGillivray, *Vict. Nat.* 41: t. 5 opp. 130 (1924); Ewart, *Plant. indig. Vict.* t. 94 opp. 31 (1910); Mueller, *Key Syst. Vict. Plant.* 2: fig. 116 (1886); Hart in *Edwards' bot. Reg.* 5: t. 426, col. (1820), as "*Amaryllis australasica*".

Vern.: Murray Lily (Darling Lily, Macquarie Crinum). *Distr.*: Restricted in Victoria to the extreme north-west, on a few sandy inundated flats along the Murray R. flood-plain west from Wentworth and locally frequent there (near Ned's Corner, Lake Wallawalla, Boundary Point); also inland waterways of N.S.W., Qd (south-western), S.A., Cent. Aust.

Diagn.: Large, bulbous, renascent perennial with pale ovoid bulbs 2-4" wide; leaves lax, basal, 1-2 ft. long, 1-4 cm. wide, flat, soft; scape stout, to 2 ft. high, ± 1 cm. thick, \pm compressed, bearing a terminal umbel of 4-15 (usually 6-9) large, white or creamy, strongly scented flowers, subtended by 2 papery, often unequal spathe-bracts 3-5" long and ± 1 " wide at base; perianth (*the largest among all native flowers of Victoria*) on stout pedicel to 2" long, consisting of a slender tube 2-4" long and suddenly expanded limb of 6 equal, elliptic, shortly apiculate segments 2-3" long and 0.5-1" wide at centre; anthers 6, yellow, crescentic, versatile, 7-12 mm. long, on slender filaments attached at base of (and almost as long as) perianth-lobes; style filiform, 4-7" long, with minute, \pm capitate stigma; ovary barrel-shaped, 8-15 \times 4-7 mm., scarcely contracted under perianth, 3-locular with several ovules per loculus; fruit a \pm fleshy, globular capsule 1-3 cm. wide, opening irregularly; seeds few (usually 2-3), often viviparous, whitish, subglobose, 6-10 mm. wide, with smooth testa.

242. CALOSTEMMA R. Br. (1810)

740. *C. purpureum* R. Br. *Prodr. Flor. Nov. Holl.* 298 (1810).

Illust.: *Curtis's bot. Mag.* 46: t. 2100, col. (1819); Black, *Flor. S. Aust.* ed. 2: fig. 280-281 (1943); Williamson, *Vict. Nat.* 45: 162 fig. 5 (1928); *Flor. Serres sér. 2*, 1: t. 1135, col. (1856); Hart in *Edwards' bot. Reg.* 5: t. 422, col. (1820).

Vern.: Garland Lily. *Distr.*: Extremely localized in Victoria where known from only two localities, viz. Lake Hattah in Kulkyn Nat. Park and Boundary Bend (near confluence of Murray R. with Murrumbidgee R.), but there not uncommon on sand subject to inundation; also inland tracts of N.S.W., S.A.

Diagn.: Bulbous renascent perennial, the ovoid to globular bulbs usually 1-1.5" wide and covered with many thin, pale-brown tunics; leaves few, basal, linear, flaccid, \pm lustrous, to 1 ft. long or more, 4-10 mm. wide; scape terete, ± 1 ft. high (rarely to 2 ft.), with terminal umbel of 8-20 (usually ± 12) yellow and purplish (rarely entirely purple) flowers subtended by 2-3 unequal, greenish spathe-bracts 1-2" long and ± 0.5 " wide at base; perianth on pedicel to 1" long,

narrowly tubular for 5-10 mm., with funnel-shaped limb, 10-15 mm. long, the 6 free segments equal, obovate-spathulate and apiculate; anthers 6, yellow, oblong, ± 2 mm. long, basifixed, the filaments free for the upper 2-3 mm., then fused into a tubular corona 6-8 mm. long (truncate or shortly lobed between free part of filaments); style filiform, 14-18 mm. long, with minute terminal stigma; ovary globular, 2-4 mm. wide, 1-locular, with 2-3 ovules; capsule globular, 5-8 mm. wide, shining, \pm fleshy and firm, indehiscent, with thin pericarp through which 2-3 embryos extrude by small holes; seed normally solitary and viviparous, filling the whole cavity of ripe capsule.

C. luteum Sims (1819) scarcely differs, except in having slightly larger, wholly yellow flowers. If merged with *C. purpureum*, then the range of the latter would be extended into Queensland (at least as far north as Rockhampton district).

[Many exotic members of *Amaryllidaceæ* are popular as garden flowers in Victoria. Of those that occasionally escape or persist on old estates, the following species may be mentioned: Chilean *Alstræmeria aurantiaca* D. Don (Yellow Alstræmeria) and Brazilian *A. pulchella* L.f. (Parrot Alstræmeria), the former with showy, orange, brown-flecked flowers and the latter with green-and-red streaked flowers, both being shade-tolerant rhizomic plants which are familiar in the Dandenong Ranges on rich volcanic loams—*A. pulchella* (syn. *A. psittacina*) is also recorded as naturalized in New South Wales; South African *Agapanthus orientalis* Leighton (Common Agapanthus) is a large, long-lived, frequent and persistent rhizomic plant in old gardens, on city embankments and rockeries, the clumps of strap-shaped leaves being often several feet wide and producing stout scapes (1-4 ft.) with white or blue flowers in globe-shaped umbels 4-8" in diameter; South African *Amaryllis belladonna* L. (Belladonna-lily) develops large bulbs which send up reddish scapes (1-3 ft.) in summer-time before the leaves appear, the large umbellate flowers (white to deep pink) being highly fragrant; *Ipheion uniflorum* (R. Grah.) Rafin., the Spring Star-flower of Argentine, is related to the onion and leek genus *Allium* (having a similar odour), but its much larger flowers (about 1" wide) are solitary, with tubular perianth, flat limb and the included stamens alternately long and short; European *Leucojum æstivum* L. (Snowflake) is distinguished by its few, not obviously umbellate, bell-shaped, pendulous flowers with free white segments (each green-tipped); the genus *Narcissus*, embracing a number of garden bulbs which may run wild, includes the Common Daffodil (*N. pseudo-narcissus* L.), Campernelle (*N. odoratus* L.), Polyanthus *Narcissus* (*N. tazetta* L.), Jonquil (*N. jonquilla* L.) and sundry hybrids—all with showy, fragrant, variously coronate flowers (white, yellow or bicolorous). J. Hutchinson, in *Families of Flowering Plants* ed. 2, 2 (Monocotyledons): 623 (1959), assigns *Alstræmeria* to a distinct family, *Alstræmeriaceæ*.]

Family 57. HYPOXIDACEÆ

243. HYPOXIS L. (1762)

Leaves and scape sprinkled (at least in lower portions) with *long silky hairs*; flowers often 2, the segments ± 8 mm. long; anthers *deeply divided* and \pm tail-like at base (rhizome short, *tuber-like*):

741. *H. hygrometrica* Labill. *Nov. Holl. Plant. Specim. 1*: 82, t. 108 (1805).

Illust.: Labillardière (l.c.); Williamson, *Vict. Nat.* 45: 162 fig. 2 (1928); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 70 (1914).

Vern.: Golden Weather-glass. *Distr.*: Except for the Mallee, northern plains, alps and heavier-forested country, widespread through Victoria, locally frequent, and common in East Gippsland (e.g. Grampians, Ballarat district, Castle-maine, Lower Glenelg R., Otways, St. Leonards, You Yangs, eastern heathlands of Port Phillip Bay, Arthur's Seat, Whittlesea, Dargo High Plains, Mitta Mitta, Wulgulmerang, Howe Range); Tas., N.S.W., Qd.

—Whole plant *glabrous*; scape usually $>1''$ high, with *single long linear* bract at or below middle; flower solitary, the segments 6-18 mm. long; anthers *not* or only shortly auriculate at base, on \pm equal filaments; capsule *oblong*, 6-8 mm. long (rhizome bulb-like, \pm covered with sheathing bases of old leaves):

742. *H. glabella* R. Br. *Prodr. Flor. Nov. Holl.* 289 (1810).

Illust.: Bishop in Elford, *Wild Life* 16: 174 (1952); Blackall, *How to Know W. Aust. Wildflowers* 75 (1954); Galbraith, *Wild Life* 3: 210 (1941); Ewart, *Flor. Vict.* fig. 147 (1931); Williamson, *Vict. Nat.* 45: 162 fig. 3 (1928); Fitch in Hooker f., *Flor. Tasm.* 2: t. 130 fig. A, *col.* (1858).

Vern.: Yellow Star. *Distr.*: With the exception of shadier mountain-forests and agricultural land, frequent almost throughout western Victoria, favouring moist grassy places and more open woodland (e.g. Far North-west, Wyperfeld Nat. Park, Big & Little Deserts, Grampians, Lower Glenelg R., Mt. Cole, Creswick, Donald, Heathcote, Rushworth, Otways, Brisbane Range, Port Phillip region), more scattered in the east (Alexandra, Ovens R., Upper Murray R., Woodside, Wilson Prom., Tonimbuk etc.) and known only from Bairnsdale, Cann R. & Upper Delegate R. in East Gippsland; all States, but apparently only in the far south of Qd.

—As for the last, but scape usually with 2 setaceous bracts *above* middle and inflorescence smaller in all its parts (scape seldom $>1''$ high, perianth-segments 3-6 mm. long, stamens usually 3 long and 3 short, capsule \pm globular and 3-5 mm. long):

743. *H. pusilla* Hook. f. *Flor. Tasm.* 2: 36, t. 130 fig. B, *col.* (1858).

Illust.: Fitch in Hooker f. (*l.c.*).

Vern.: Tiny Star. *Distr.*: Scattered through grassland and open parts of western and northern Victoria (Wando Vale near Casterton, Dimboola, St. Arnaud, Whipstick Scrub near Bendigo, Shepparton, Laverton), but exact range uncertain owing to confusion with reduced states of *H. glabella*; N.S.W., S.A., Tas., N.Z.

[The present concept of the genus *Hypoxis* in Africa is narrower than heretofore, embracing only those species with more or less villous foliage, subumbellate or racemose flowers and basifixed anthers. On the basis of these criteria, the Australian entities now referred to *Hypoxis* would need to be accommodated under another genus—perhaps *Spiloxene* Salisb.—but it is also possible that *H. hygrometrica* and *H. glabella* (with *H. pusilla*), differing manifestly in their root-systems, are not strictly congeneric. Until the whole situation is carefully assessed, it is deemed advisable to retain the three Victorian representatives under *Hypoxis* (in the broad sense).]

Family 58. IRIDACEÆ

1. Inflorescence of a *single*, terminal, regular, pale pink to deep rosy-magenta flower, with scape much *shorter than* the very narrow, grass-like, tough, radical leaves which arise from an underground corm
244. **Romulea*
Inflorescence with *several to many* flowers or, if reduced to one in occasional starved specimens, then *longer than* the foliage 2
2. Flowers always 1 to each spathe, *sessile* (usually spicate) and *not* short-lived; 3 stamens functional, *unilateral* (except in *Ixia*) 9
Flowers 2 or more to a spathe, usually stalked, \pm fugitive (often withering in a few hours); 3 stamens *symmetrically arranged* (or 1 without an anther) 3
3. Perianth \pm 1" wide, *zygomorphic* (the upper sepal larger than others, all 3 *white* and much larger than the unequal, mauve- or yellow-tinted petals); upper stamen *devoid of an anther*; style-branches \pm petaloid; capsule exserted 248. *Diplarrena*
Perianth *regular*, if ever white then either $<1"$ or $>2"$ wide; all 3 stamens *bearing anthers* 4
4. Capsule completely *enclosed* by 2 large, opaque, stiffly-erect bracts of spathe; flowers *blue or violet*, with 3 obovate style-branches *alternating* with the anthers 251. *Patersonia*
Capsule *not* enclosed by spathe or, if sometimes hidden, then the spathe membranous and colourless; flowers *not* simultaneously bluish and with obovate style-branches 5
5. Stigmas at the *ends* of style-branches which are *not* petaloid 7
Stigma a small flap on the *under side* of each dilated *petaloid* style-branch which terminates in 2 *erect lobes or crests* 6
6. Perianth-segments united below in a *short tube*; staminal filaments *free*; fruit exserted (leaves usually \pm broad and *sword-shaped*; rootstock a *rhizome*) 245. **Iris*
Perianth-segments *free* to their attachment on the *beakless* ovary; staminal filaments \pm *united* in a tube around the style; fruit *exserted* beyond the green spathe (leaves narrow-linear, \pm grass-like; rootstock a *corm*) **Moræa* (p. 343)
As for the last, but ovary produced into a distinct *apical beak* (\pm 1 cm. long), capsule \pm *enclosed* by the papery, colourless spathe and leaves *filamentous* (\pm 1 mm. wide) 246. **Gynandiris*
7. Flowers bright yellow, orange or salmon-red, with segments >2 cm. long; style-branches *opposite* the anthers, *short and truncate* 247. **Homeria*
Flowers whitish or blue, with segments <2 cm. long; style-branches *alternating* with anthers, *filamentous* 8
8. Flowers *blue*, on *short stout erect* peduncles; capsule *trigonous*, narrowed at both ends (rare coastal plant of far south-west Victoria) 252. *Orthrosanthus*
Flowers *white*, on *slender wide-spreading* peduncles; capsule *globose*; stems terete or \pm angular (*rhizomic*, distichous perennials of the eastern highlands) 249. *Libertia*

- As for the last, but *tufted* plants having \pm 2-winged stems and *veined creamy* flowers with blue or *purplish* centres (slender weeds of pastoral and open country) 250. **Sisyrinchium*
9. Perianth with *oblique* limb and *long curved tube*; stamens unilateral 12
Perianth with \pm *symmetrical* limb and *short straight tube*; style-branches undivided 10
10. Spathe-bracts 12-25 mm. long, membranous or papery, becoming *deeply lacerated* at apex; flowers few; stamens unilateral 256. **Sparaxis*
Spathe-bracts <12 mm. long (often only 5 mm.), remaining *intact* or almost so 11
11. Stamens *equilateral* (symmetrically placed); style-branches *subulate* or *filiform*; flowers usually numerous, *spirally* and \pm densely arranged on the slender, simple scape; capsule many-seeded 253. **Ixia*
Stamens *unilateral*; style-branches *widened* towards end; flowers 7-15 in a loose *distichous spike*; capsule oblong, *many-seeded* 254. **Tritonia*
Stamens \pm *symmetrically* placed; style-branches *widened* towards end; flowers up to 25, orange-yellow in a \pm *flattened panicle*; capsule *inflated*, globose, 3- to 5-seeded 255. **Crocasmia*
12. Style-branches each *bifid* 14
Style-branches *undivided* 13
13. Flowers in a *unilateral spike*, usually pink, white or greenish, the perianth-tube \pm funnel-shaped, dilating *gradually*; spathes *herbaceous* >3 cm. long 257. **Gladiolus*
Flowers numerous in a *distichous spike* (or panicle), red-and-yellow, the perianth-tube narrow and \pm cylindrical in lower half, *suddenly dilating* at or beyond the middle; spathes *membranous*, \pm papery, <2 cm. long **Pentamenes* (p. 342)
14. Spikes *robust*, 2-6 ft. high, *erect* throughout, with many 2-ranked or spirally arranged flowers; stamens inserted *half-way* down tube of perianth (capsule smooth, <6 mm. wide) 259. **Watsonia*
Spikes *slender*, usually <1 ft. high, the upper part *sharply bent* (\pm horizontally), with few *unilateral* flowers; stamens inserted *below* middle of perianth-tube (capsule tuberculate, \pm 10 mm. wide) 258. **Freesia*

244. *ROMULEA Maratti (1772)

744. *
- R. rosea*
- (L.) Eckl.
- Topogr. Verz. Pflanzensamml.*
- 19 (1827).

Ixia rosea L. *Syst. Nat.* ed. 12, 2: 75 (1774);*R. bulbocodium* sens. Ewart *Flor. Vict.* 298 fig. 149 (1931), non (L.) Sebast. & Mauri (1818).

Illust.: Ewart (l.c.); Black, *Flor. S. Aust.* ed. 2: fig. 288 (1943); Davey, *J. Dep. Agric. Vict.* 20: 668 (1922), as "*R. cruciata*"; Wauer in Ewart, *Weeds . . . Vict.* t. opp. 58, col. (1909), as "*R. cruciata*"; Burton in Helms, *Agric. Gaz. N.S.W.* 12: t. opp. 232, col. (1901); Dixie in Marloth, *Flor. S. Afr.* 4: t. 43 fig. C, col. (1915).

Vern.: Onion-grass (Guildford-grass, Frutang—Afrikaans). *Distr.*: Indigenous to South Africa; introduced into W.A., S.A., N.S.W. and Victoria where an abundant weed of the lowlands—in lawns, pastures and by roadsides (e.g. Murrayville, Nhill, Nareen near Coleraine, St. Arnaud, Camperdown, Creswick, Graytown, Brisbane Range, St. Leonards, Melbourne, Tyers, Bairnsdale, Lakes Entrance).

Diagn.: Small perennial with smooth, brown-coated, globose corms \pm 1 cm. in diameter; leaves 3-10, narrow-linear, very tough, 3-12" long, 1-2 mm. wide, compressed, with thickened edges and prominent midrib (appearing in transverse section like a crossed dumbell), the subterranean sheathing bases broadening to 3-5 mm.; flowers 2-4 per corm, each on a terete, shiny, sometimes arched, radical peduncle 1-4" long (or more) and subtended by a pair of lanceolate, striated, \pm scarios, spathe-like bracts 6-16 mm. long (the upper one shorter, with hyaline, brown-flecked margins); perianth usually 10-20 mm. long, pink to deep rosy-purple or magenta, with yellow centre, the tube 2-3 mm. long and 6 equal, spreading, lanceolate, 3-veined segments 5.18×1.54 mm.; anthers 3, erect, 3-5 mm. long, on free filaments of equal length; style slender, 4-8 mm. long, with 6 short stigmatic arms in pairs; ovary ellipsoid, 3-5 mm. long, 3-locular, with numerous ovules; capsule broadly oblong, 6-10 mm. long, transversely wrinkled, usually 10- to 30-seeded opening very widely into 3 leathery blunt lobes; seeds \pm globular or angled by compression, \pm 2 mm. in diameter, reddish-brown, smooth, shining.

[Highly variable in size and flower-colour, but the form most commonly found in Victoria is doubtless referable to var. *parviflora* J. G. Baker *Handb. Iridæ* 104 (1892), having slightly flattened leaves 1-2.5 mm. wide and perianths 1.5-2 cm. long (cf. typical *R. rosea*, with terete or filiform leaves and perianth 2-3 cm. long or more). In *Flor. S. Aust.* ed. 2: 528 (1952), J. M. Black takes up the name *R. cruciata* (Jacq.) Eckl. for South Australian populations previously called *R. rosea*, because their leaves in section are shaped like a Maltese cross. But G. J. Lewis in *Flor. Cape Penins.* 222 (1950) had also ascribed to *R. cruciata* a leaf-width of 3 mm. and blue flowers 2.5-3 cm. long—features that are not apparent in any Victorian collections examined by the writer.]

245. *IRIS L. (1753)

745. **I. germanica* L. *Spec. Plant.* 1: 38 (1753).

Illust.: Edwards in *Curtis's bot. Mag.* 18: t. 670, *col.* (1803), also t. 671, *col.* (1803) as "*I. florentina*"; Black, *Flor. S. Aust.* ed. 2: fig. 289 (1943); Black, *Naturalised Flor. S. Aust.* 148 (1909); Herter, *Flor. il. Uruguay* 1: fig. 974 (1943); Bailey, *Standard Cycl. Hort.* new ed., 2: fig. 1968 (1925); Poinso in Bonnier, *Flor. compl. Franc., Suisse & Belg.* 10: t. 599, *col.* (1929); Pfenninger in Hegi, *Ill. Flor. Mittel-Eur.* 2: t. 66 fig. 1, *col.* (1909); Coste, *Flor. Franc.* 3: fig. 3529 (1906), also fig. 3528 (1906) as "*I. florentina*"; *Garden* 48: t. 1033, ref. p. 242, *col.* (1895); Reichenbach, *Icon. Flor. germ.* 9: t. 338, *col.* (1847), also t. 339, *col.* (1847) as "*I. florentina*".

Vern.: German Iris (Common Flag Iris, Fleur-de-lis). *Distr.*: Probably indigenous to the Mediterranean region, but so long cultivated and escaping in Europe and western Asia that wild occurrences are now very doubtful; introduced as a garden flower and now spontaneous in N. & S. Amer., S.A., N.S.W. and Victoria where of scattered and limited occurrence, usually about homesteads (e.g. Melbourne, Hamilton, railway track near Maroona where conspicuous, Beechworth).

Diagn.: Perennial with stout, thick (1-2"), fleshy, much-branching, superficial rhizomes; leaves appearing radical, but equitant and \pm distichous on shoots of rhizome, flat, ensiform, 12-18" long, 1-2" wide, glaucous; inflorescence to 2 ft. high (or more), paniculate, typically with 2-5 clusters of flowers on \pm erect branches exceeding the papery stem-bracts; flowers 1-3, opening singly from the half-scarious, often purplish spathe (1.5-2" long), each on a very short brittle pedicel; perianth large and showy, purple or bluish or white, with very short tube, 3 obovate and long-deflexed, equal outer segments (the "falls"), and 3 obovate, \pm undulate, erect inner segments (the "standards"); falls and standards \pm equal, 2-4" long, 1-2" wide, the former deeply veined toward base, with a yellowish beard of papilliform hairs along lower half of midrib; anthers 3, linear, 6-10 mm. long, basifixed on free, rather longer filaments; styles 3, with wide petaloid wings (15-20 mm. broad) that arch over the anthers and end in 2 erect acute lobes; capsule ovoid-oblong, 1-2" long, 3-locular, 3- to 6-angled; seeds numerous, ovoid, reddish-brown, wrinkled, 5-7 \times 3-4 mm.

246. *GYNANDRIRIS Parl. (1854)

746. **G. setifolia* (L.f.) R. C. Foster in *Contr. Gray Herb. Harv. new ser.* 114: 40 (1936).

Iris setifolia L. f. *Suppl. Plant.* 99 (1781);

Moræa xerospatha MacOwen ex J. G. Baker in *Flor. capens.* 6: 529 (1897).

Illust.: Black, *Flor. S. Aust.* ed. 2: fig. 290 (1943); Black, *Naturalised Flor. S. Aust.* 148 (1909)—both as "*Moræa xerospatha*".

Vern.: Thread Iris. *Distr.*: Indigenous to South Africa; introduced into N.S.W., S.A. (Adelaide etc.), W.A. and Victoria where scattered on open sandy ground in western districts and of very limited occurrence (Cohuna, Mildura, Murrayville, Kaniva, Horsham, Neuarpuir near Apsley, Coleraine, Melbourne at Fawkner Park etc.).

Diagn.: Low perennial with pale globose corms (\pm 1.5 cm. in diameter) encased in interwoven, sharp-pointed fibres; leaf solitary, radical, very tough, narrow-linear, often 1-2 ft. long, but only 1-3 mm. wide, with long-filiform apex; stem short (1-2"), bearing 3-5 papery hyaline spathes \pm 1" long, each spathe containing 4-6 shortly stalked flowers that open singly; perianth-segments 6, free to their attachment on the beaked ovary, spreading, clawed, \pm spathulate, subequal in length (10-16 mm.), but inner 3 much narrower (\pm 2 mm. wide), lilac or pale-mauve, blotched with orange and purple; anthers 3, oblong, \pm 2 mm. long, their filaments \pm united in a tube; style-branches 3, terminating in erect, bifid, acuminate, petaloid lobes to 10 mm. long; body of capsule cylindrical, 10-15 mm. long, the upper part sharply contracting into a filiform beak 7-10 mm. longer, 3-locular, many-seeded; seeds dull, brown, angular, 1-1.5 mm. long.

247. *HOMERIA Vent. (1808)

Basal leaf *solitary*, without axillary bulbils; flower-clusters 1-4; perianth-segments >1 " long, typically pale salmon or yellow; staminal tube *glabrous*; anthers 7-10 mm. long; style-branches *free*; ovary 15-20 mm. long (tunic of corm *thick, brown*, with \pm spine-tipped fibres):

747. **H. breyniana* (L.) G. J. Lewis in *J. S. Afr. Bot.* 7: 59 (1941).

Tulipa breyniana L. *Spec. Plant.* 1: 306 (1753);

H. collina Vent. *Dec. Gen. nov.* 5 (1808).

Illust.: Edwards in *Curtis's bot. Mag.* 26: t. 1033, col. (1807), as "*Moræa collina*", also 39: t. 1612, col. (1814), as "*M. collina* var. *miniata minor*"; Ross-Craig in *Curtis's bot. Mag.* 160: t. 9487, col. (1937); Stanislawski in Parsons, *J. Dep. Agric. Vict.* 56: 381, col. (1958), as "*H. breyniana*"; Whittet, *Weeds* (N.S.W. Dep. Agric.) fig. 61 (1958); *Tasm. J. Agric.* 25: 157 (1954); Adams in Connor, *Bull. Dep. sci. industr. Res., N.Z.* 99: fig. 38 B-C (1951); Black, *Flor. S. Aust.* ed. 2: fig. 292 (1943); Wall in Clarke, *Bull. Dep. Agric. S. Aust.* 343: t. opp. 34, col. (1939); King in Carn, *Control of Weeds* (N.S.W.) t. opp. 40, col. (1939); Gardner, *J. Dep. Agric. W. Aust.* ser. 2, 4: 555 fig. B-C (1927); *J. Dep. Agric. S. Aust.* 12: 334 (1908)—all, except Edwards and Stanislawski, as "*H. collina*".

Vern.: One-leaf Cape Tulip (Tulp—Afrikaans). *Distr.*: Indigenous to South Africa; introduced and established as a noxious, poisonous weed in N.Z., N.S.W., S.A., W.A., Tas. (north-east) and Victoria where widespread through the western half and locally abundant—Murrayville, Goroke (heavy infestation), Casterton, Glenthompson, Swanwater near St. Arnaud (heavy infestation over some 5000 acs.), Bendigo, Graytown, Winchelsea (heavy growth), Melbourne suburbs—with only scattered occurrences in the east (e.g. Pakenham and Morwell districts).

[The more frequent form in Victoria appears to be var. *aurantiaca* (Sweet, *ut sp.*) G. J. Lewis (? *l.c.*), distinguished by its bright salmon-pink to scarlet flowers having more acute segments. *H. ochroleuca* Salisb., with yellow perianth-segments forming a deep cup about 2 cm. wide, has been much confused with *H. breyniana*; it may possibly occur in Victoria, but definite evidence is lacking.]

Basal leaves 2-3, sometimes with *bulbils* (cormlets) at the swollen nodes; flower-clusters >4 (up to 10); perianth-segments up to 1" long, bright salmon-pink (pale yellow at base); staminal tube *pubescent* and ± swollen toward base; anthers <5 mm. long; style-branches *cohering*, very short; ovary <15 mm. long (tunic of corm *blackish*, with ± woody, fenestrated fibres):

748. **H. miniata* (Andr.) Sweet *Brit. Flower-gdn* 2: t. 152 (1826).

Moræa miniata Andr. *Bot. Repos.* 6: t. 404, col. (1804).

Illust.: Andrews (*l.c.*); Sweet (*l.c.*); Stanislawski in Parsons, *J. Dep. Agric. Vict.* 56: 380, col. (1958); Whittet, *Weeds* (N.S.W. Dep. Agric.) fig. 61 (1958); Black, *Flor. S. Aust.* ed. 2: fig. 293 (1943); Wall in Clarke, *Bull. Dep. Agric. S. Aust.* 343: t. opp. 32, col. (1939); Gardner, *J. Dep. Agric. W. Aust.* ser. 2, 4: 555 fig. A (1927); *J. Dep. Agric. S. Aust.* 12: 333 (1908); Wauer in Ewart, *Weeds ... Vict.* t. opp. 56, col. (1909), as "*H. collina* var. *miniata*"; Stewart, *Agric. Gaz. N.S.W.* 16: 957-959 (1905); Rice, *Wild Flowers Cape G.H.* t. 190, col. (1951), as "*H. aurantiaca*"; Thwaites & Dixie in Marloth, *Flor. S. Afr.* 4: t. 40 fig. D, col. (1915), as "*H. aurantiaca*".

Vern.: Two-leaf Cape Tulip (Rooitulp—Afrikaans). *Distr.*: Indigenous to South Africa; introduced and established as a noxious, poisonous weed in W.A., S.A., N.S.W. and Victoria where apparently still localized in Yambuk, Carisbrook, Maryborough and Dunolly districts, but with serious infestation in the first two places.

248. *DIPLARRENA* Labill. (1799)—etymol. orig.749. *D. moræa* Labill. *Voy. 1*: 157, t. 15 (1799).

Illust.: Labillardière (*l.c.*); Galbraith, *Wildflowers Vict.* t. 14 (1950); Bishop in *Elford, Wild Life* 16: 175 (1952), also 1: 20 (Oct. 1939); Barrett, *Wild Life* 6: 143 (1944); Bishop in Barrett, *Aust. Wildflower Book* 173 (1942); Williamson, *Vict. Nat.* 45: 220 fig. 1 (1928); Relph in Pescott, *Native Flowers Vict.* t. opp. 92 (1914); Rodway, *Some Wild Flowers Tasm.* t. opp. 89 (1910); Meredith, *Bush Friends Tasm.* t. 10, col. (1860); Bowles, *Garden, Lond.* 83: 315 (1919).

Vern.: Butterfly Flag (White Iris—Tas.). *Distr.*: Widely distributed and locally not infrequent in cooler parts of eastern Victoria, often in open rocky places, but apparently absent from the north-east and alpine stations (e.g. Dandenongs, Upper Beaconsfield, Pakenham, Wilson Prom., between Mts. Barkly & Ligar, Snowy R., sources of Brodribb R., Upper Delegate R., Bonang, Cann R. valley, Wingan Inlet, Howe Range); also Tas. (abundant) and N.S.W. (south coastal region).

Diagn.: Shortly rhizomic, tussock-forming perennial to 2 ft. high; leaves chiefly radical, distichous on shoots, equitant at base, very flat, narrow-linear, 1-2 ft. long, 5-10 mm. wide, striated with 20-30 nerves; stem 1-2 ft. high, simple or slightly branched, with 2-4 leaf-like erect bracts (becoming shorter above), terminating in 2 erect, \pm equal spathe-bracts (2-3" long) which subtend the 2-6 honey-scented flowers; perianth with a pedicel 1-2" long and \pm 1 mm. thick, slightly irregular, divided to the ovary into 6 white obovate-cuneate segments (1 outer segment \pm 3 cm. long, 1.5-2 cm. wide, slightly larger and more concave than other 2 more spreading segments; inner 3 segments much shorter, \pm 2 cm. long, narrower, more erect, often with yellow or purplish tints toward apex); staminal filaments 3, free, the upper one short and without any anther, the other two unequal, 4-7 mm. long, each with a narrow-oblong anther 2.5-3 mm. long; style slender, longer than stamens, with 3 broad, white, petaloid laminae bearing the stigmas (one lamina much larger than others); capsule 1.5-2.5 cm. long, coriaceous, oblong-ellipsoid, tapering below, acutely 3-angled and 3-locular, the ripe valves hardly spreading at dehiscence; seeds numerous, discoid, very flat, 2-3.5 mm. wide, smooth, \pm shining, dark brown, sometimes \pm 2-winged around circumference.

249. *LIBERTIA* Spreng. (1824)

Stems <1 ft. high; leaves up to 7" long, closely distichous; flower-clusters few (1-5); perianth-segments 3-6 mm. long, *subequal*; capsule 3-4 mm. wide (rhizome *slender*):

750. *L. pulchella* (R. Br.) Spreng. *Syst. Veg. 1*: 169 (1824).

Sisyrinchium pulchellum R. Br. *Prodr. Flor. Nov. Holl.* 305 (1810).

Illust.: Galbraith, *Wildflowers Vict.* t. 16 (1950); Williamson, *Vict. Nat.* 45: 220 fig. 7 (1928); Fitch in Hooker f., *Flor. Tasm.* 2: t. 129, col. (1858), as "*L. lawrencei*".

Vern.: Pretty Grass-flag. *Distr.*: Damp, shaded, montane to subalpine forest-land of eastern Victoria where locally not uncommon, often on mossy rocks or around the butts of old *Nothofagus* trees (e.g. Mt. Donna Buang, Cumberland Falls & Lake Mountain, sources of Latrobe R., Baw Baws, Mt. Buller, Mt. Ellery, heads of Delegate R.), with an isolated occurrence in fern gullies near Cape Otway; Tas., N.S.W. (as far north as Barrington Tops, at 5000 ft.), N.Z., N.G. (above 10,000 ft. alt.).

Stems 1-2 ft. high; leaves 7-18" long; flower-clusters usually >5, in a loose irregular panicle; perianth-segments 8-12 mm. long, the inner series rather larger; capsule 6-10 mm. wide (rhizome *short*):

751. *L. paniculata* (R. Br.) Spreng. *Syst. Veg.* 1: 168 (1824).

Sisyrinchium paniculatum R. Br. *Prodr. Flor. Nov. Holl.* 305 (1810).

Illust.: Fitch in *Curtis's bot. Mag.* 102: t. 6263, col. (1876); Forster in Harris, *Wild Flowers Aust.* t. 58, col. (1947); Williamson, *Vict. Nat.* 45: 220 fig. 8 (1928); Sulman, *Aust. Wild Flowers* ser. 2: t. 24 (1913).

Vern.: Branching Grass-flag. *Distr.*: Confined in Victoria to East Gippsland where scattered through near-coastal forests between Orbost and Cape Howe, but rather uncommon (Cabbage-tree Ck., Genoa Peak and Gorge, Mallacoota); N.S.W., Qd.

250. *SISYRINCHIUM L. (1753)

Perennial >6" high, the stem *winged* or strongly 2-angled; perianth-segments 3-10 mm. long, cream with *prominent purplish-brown veins*; capsule 6-8 mm. long:

752. **S. iridifolium* Kunth in Humb. et al. *Nov. Gen. & Spec.* 1: 323 (1816).

S. bermudiana sens. Ewart *Flor. Vict.* 302 (1931) et. auctt. Aust. al., non L. (1753).

Illust.: Bettfreund, *Flor. Argentina* 3: t. 133 (1902); Loddiges, *Bot. Cab.* 20: t. 1979, col. (1833); Hart in *Edwards' bot. Reg.* 8: t. 646, col. (1822), as "*Marica iridifolia*".

Vern.: Striped Rush-leaf (Blue Pigroot). *Distr.*: Indigenous to tropical and sub-tropical South America; introduced into New South Wales and Victoria where a widespread weed in cooler southern districts, locally frequent in near-coastal localities (e.g. Portland area, Otways, Arthur's Seat, Mordialloc, Melbourne, Dandenongs, Beaconsfield, Graytown, Inverloch, Bairnsdale).

Annual <6" high, the stem *slightly 2-angled*; perianth-segments 3-4 mm. long, yellowish; capsule \pm 3 mm. long, almost globular:

753. **S. micranthum* Cav. *Monadelph. Class. Diss. dec.* 6: 345, t. 191 fig. 2 (1788).

Illust.: Cavanilles (*l.c.*); *Curtis's bot. Mag.* 47: t. 2116, col. (1819); Payne in Bailey, *Weeds & suspect. poison. Plant. Qd.* fig. 337 (1906).

Vern.: Scour-weed. *Distr.*: Indigenous to Peru; introduced into N. Cal., N.Z. (North Cape region), Qd. (where abundant, causing violent scouring when grazed by stock), N.S.W., and Victoria where apparently of scattered inconsequential occurrence (Doncaster, Store Ck. near Bairnsdale, Cann R.), but perhaps overlooked, as a depauperate condition of the common *S. iridifolium*, and actually more widespread in the State than present records would suggest.

251. PATERSONIA R. Br. (1807)

1. Plant \pm *hairy* (at least on spathe) 3
Plant quite *glabrous*; peduncle leafless 2
2. Scape *shorter than the* \pm glaucous, slightly flattened to *almost terete* leaves; perianth-tube *exserted* well beyond the spathe:

754. *P. fragilis* (Labill.) Druce in *Rep. bot. (Soc.) Exch. Cl. Manchr* 1916: 639 (1917).

Genosiris fragilis Labill. *Nov. Holl. Plant. Specim.* 1: 13, t. 9 (1804);
P. glauca R. Br. *Prodr. Flor. Nov. Holl.* 304 (1810).

Illust.: Labillardière (l.c.); E. D. in *Curtis's bot. Mag.* 53: t. 2677, col. (1826); Williamson, *Vict. Nat.* 45: 220 fig. 2 (1928); Relph in Pescott, *Native Flowers Vict.* t. opp. 93 (1914); H. E. S. in Mueller, *Key Syst. Vict. Plant.* 2: fig. 114 (1886); Meredith, *Bush Friends Tasm.* t. 6, col. (1860); Bauer in Endlicher, *Icon. Gen. Plant.* t. 50 (1838)—all except Labillardière as "*P. glauca*".

Vern.: Short Purple-flag (Blue Iris—Tas.). *Distr.*: Widespread on damp near-coastal heaths of southern Victoria from the Lower Glenelg R. to Howe Range, and locally rather common (e.g. near Portland, Grampians, Otways, Torquay, eastern side of Port Phillip Bay where now almost exterminated, French Id, Foster, Wilson Prom., grass-tree plains of East Gippsland); S.A., Tas., N.S.W., Qd (far south near Wallangarra).

—Scape *longer than* the flat leaves; perianth-tube *not or hardly* exceeding the spathe:

755. *P. longiscapa* Sweet *Flor. aust.* t. 39, col. (1827–28).

Illust.: Sweet (l.c.); Black, *Flor. S. Aust.* ed. 2: fig. 294 (1943); Williamson, *Vict. Nat.* 45: 220 fig. 3 (1928); Charsley, *Wild Flowers Melb.*, t. 3 fig. 3, col. (1867), as "*P. glauca*"; Ostenfeld, *Biol. Medd., Kbh.* 3²: t. 3 fig. 4 (1921).

Vern.: Long Purple-flag. *Distr.*: Widely distributed on swampy ground of near-coastal heaths in Southern Victoria from the Lower Glenelg R. to Wingan Inlet, and locally frequent (e.g. Mt. Clay near Portland, Grampians, eastern side of Port Phillip Bay where now almost exterminated, Upper Beaconsfield, Tonimbuk, Merriman's Ck near Dutson, Wilson Prom., near Orbost); also S.A., Tas.

3. Peduncle slender, \pm leafy below the middle, either glabrous or with short silky pubescence above; spathe-bracts slightly silky-hoary, shortly exceeded by the perianth-tube; flowers often clear blue; leaves \pm 3 mm. broad:

756. *P. glabrata* R. Br. *Prodr. Flor. Nov. Holl.* 304 (1810).

Illust.: Forster in Harris, *Wild Flowers, Aust.* t. 44, col. (1947); Leithead, *Wild Life* 4: 97 (1942); Williamson, *Vict. Nat.* 45: 220 fig. 5 (1928); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 68 (1914); Edwards' *bot. Reg.* 1: t. 51, col. (1815).

Vern.: Leafy Purple-flag. *Distr.*: Confined in Victoria to coastal heaths and open forest on lower hills of East Gippsland, where widespread and not uncommon (e.g. Marlo, Mt. Kaye, Genoa Peak, Howe Range), with an isolated record for Wilson Prom.; also N.S.W., Qd.

—Peduncle leafless, silky-woolly toward the end, \pm 1 ft. high; spathe-bracts covered with a deciduous wool (dark and prominently striate when the wool wears off), longer than perianth-tube; flowers deep violet-blue; leaves 3–4 mm. broad (at least the basal edges very woolly):

757. *P. sericea* R. Br. in *Curtis's bot. Mag.* 26: t. 1041, col. (1807).

Illust.: Edwards in *Curtis's bot. Mag. (l.c.)*; Williamson, *Vict. Nat.* 45: 220 fig. 4 (1928); Thomson, *Flowers of our Bush* t. 2 (1929); Sulman, *Some Familiar Wild Flowers* t. 43 (1913).

Vern.: Silky Purple-flag (Bush Flag—N.S.W.). *Distr.*: Scattered on rocky terrain in coastal to subalpine tracts of Gippsland and far north-eastern Victoria, but rather uncommon (Moroka R. Valley near Mt. Wellington, Pine Mountain on Upper Murray R., Upper Genoa R., Howe Range, Mallacoota); also N.S.W., Qd.

—As for the last, but scapes shorter (<6"), leaves *much narrower* (1-2 mm. wide) and the lower parts of their margins beset with *long silky hairs*:

758. *P. longifolia* R. Br. *Prodr. Flor. Nov. Holl.* 303 (1810).

Illust.: Nil.

Vern.: Dwarf Purple-flag. *Distr.*: Extremely localized in Victoria where known only from the sandstone area along Upper Genoa R. and Yambulla Ck (at their confluence near N.S.W. border); also N.S.W. (as far north as Hunter R.).

252. ORTHROSANTHUS Sweet (1827-28)

759. *O. multiflorus* Sweet *Flor. aust.* t. 11, col. (1827-28).

Illust.: Sweet (*l.c.*); Galbraith, *Wild Flowers Vict.* t. 13 (1950); Williamson, *Vict. Nat.* 45: 220 fig. 6 (1928); Holden in *Paxton's Mag. Bot.* 11: t. opp. 245, col. (1844); Loddiges, *Bot. Cab.* 15: t. 1474, col. (1828).

Vern.: Morning-flag. *Distr.*: In Victoria confined to the far south-west coast and uncommon (Cape Nelson); also S.A., W.A.

Diagn.: Shortly rhizomic perennial herb with stems 1-2 ft. high; leaves radical, erect, grass-like, linear, acuminate, equitant, flat, 6-18" long, 2-6 mm. broad, striated with 15-20 nerves, glabrous; inflorescence a narrow panicle of stalked or sessile flower-clusters slightly exceeding the foliage; flowers sessile, 3-7 together, enclosed between 2 outer, striated, ovate-lanceolate bracts (10-20 mm. long) that are green with scarious margins, and each flower subtended by an entirely scarious, hyaline spathe-bract 10-15 mm. long; perianth clear blue, with very short tube 1-2 mm. long and 6 subequal, widely spreading, bluntish, obovate segments 12-20 × 5-10 mm; anthers 3, oblong-linear, 2-5 mm long, erect, ± versatile on free, ± flattened filaments 4-5 mm. long; styles 3, linear-filiform, ± 5 mm. long, dark, alternating with anthers; ovary ovoid-oblong to narrowly barrel-shaped, 4-6 mm. long, 3-locular, with numerous ovules per loculus; capsule broadly cylindric, narrowed at each end, trigonous with rounded edges, 12-20 mm. long, 4-6 mm. wide, many-seeded; seeds 1-2 mm. long, subglobose, ± angular, brown, minutely wrinkled.

253. *IXIA L. (1762)

Leaves up to 5 mm. wide (seldom more); spathe-bracts 5-7 mm. long, ± obtuse, whitish and clear; flowers *creamy-white or bluish* (rarely yellow), sometimes with a *blue or green circular blotch* at the centre, the tube 6-10 mm. long (plant usually of damp flats or shaded places):

760. **I. polystachya* L. *Spec. Plant.* ed. 2, 1: 51 (1762).

Illust.: Edwards in *Curtis's bot. Mag.* 17: t. 623, col. (1803), as "*I. erecta*".

Vern.: Variable *Ixia*. *Distr.*: Indigenous to South Africa; introduced as a garden flower into Victoria where sometimes persisting and locally spontaneous about old estates, in cemetery enclosures or along roadsides (e.g. Creswick cemetery Campbellfield, Warragul).

Leaves 5-10 mm. wide; spathe-bracts 7-10 mm. long or more, *acuminate or mucronate*, minutely but prominently *flecked with brown*; flowers *golden-yellow* (the 3 outer segments often externally red), with a conspicuous *purplish-brown blotch* at the centre, the tube sometimes to 1.5 cm. long (plant of dry open places):

761. **I. maculata* L. *Spec. Plant.* ed. 2, 2: 1664 (1762).

Illust.: Edwards in *Curtis's bot. Mag.* 15: t. 539, col. (1801), as "*I. conica*"; Herter, *Flor. il. Uruguay* 1: fig. 960 (1943); Hegi, *Ill. Flor. Mittel-Eur.* ed. 2, 7: 164 (1931); Bailey, *Standard Cycl. Hort.* new ed., 2: fig. 2003 (1925); Phillips, *Flowering Plant. S. Afr.* 9: t. 329 (1929); Thwaites & Dixie in Marloth, *Flor. S. Afr.* 4: t. 42 fig. D, col. (1915); Loudon, *Ladies' Flower-Gdn ornament. bulbous Plant.* t. 18 fig. 2, col. (1841), as "*I. conica*".

Vern.: Yellow *Ixia* (Geel Kalossie—Afrikaans). *Distr.*: Indigenous to South Africa; introduced as a garden flower into parts of Europe, Egypt and Victoria where occasionally escaping, on open sandy ground (e.g. Melbourne bay-side suburbs, Greenvale near Broadmeadows, Maldon, Avoca, Horsham).

[*Ixia* species have been much hybridized, *I. maculata* providing one of the important parent stocks for innumerable, showy, horticultural forms; possibly some of these have also run wild in various parts of Victoria.]

254. *TRITONIA Gawl. (1802)

762. **T. lineata* (Salisb.) Gawl. in *Ann. Bot., Lond.* 1: 228 (1804).

Gladiolus lineatus Salisb. *Prodr. Stirp.* 43 (1796).

Illust.: Edwards in *Curtis's bot. Mag.* 14: t. 487, col. (1800), as "*Gladiolus lineatus*"; Loudon, *Ladies' Flower-Gdn ornament. bulbous Plant.* t. 16 fig. 5, col. (1841).

Vern.: Lined *Tritonia* (Pencilled Corn-flag). *Distr.*: Indigenous to South Africa; introduced into flower gardens of N.S.W., S.A. (Mt. Lofty foothills) and Victoria where sometimes escaping and persisting (e.g. Melbourne bay-side suburbs, Geelong, Creswick cemetery, Charlton).

Diagn.: Renascent, cormogenous, perennial herb with stems 1-2 ft. high; leaves 4-6, chiefly basal, equitant, linear-lanceolate, 5-12" long, 6-12 mm. wide, acuminate, flat, with prominent mid-nerve and 2 intramarginal nerves; flowers 7-15 in a loose, distichous, \pm zig-zag spike, each subtended by a pair of stiff, scarious, striated, brown, elliptical spathe-bracts 10-16 mm. long (the inner slightly shorter and more hyaline); perianth pale creamy-yellow, with 3 parallel nerves and prominent diverging veins down each lobe, funnel-shaped, the wide tube 10-16 mm. long and 6 equal, blunt, obovate-oblong lobes 15-20 mm. long; anthers 3, linear, purplish, basifixed, \pm 8 mm. long, on slightly longer, almost free, unilateral arching filaments; style \pm 20 mm. long, with 3 curved linear-cuneate branches 3-4 mm. long; capsule oblong, 3-4 mm. long, trigonous, with many narrow brown seeds 0.5-1 mm. long.

255. *CROCOSMIA Planch. (1851-52)

763. **C. aurea* (Pappe ex Hook.) Planch. in *Flor. Serres* sér. 1, 7: 161 (1851-52).
Tritonia aurea Pappe ex Hook. in *Curtis's bot. Mag.* 73: t. 4335, col. (1847).

Illust.: Fitch in Hooker (*l.c.*); Franks in Wood, *Natal Plant.* 6: t. 519 (1909); Smith, *Gdnrs' Chron.* ser. 3, 28: 175-177 (1900); *Garden* 54: 83 (1898), as "*Tritonia aurea*"; Holden in *Paxton's Mag. Bot.* 15: t. opp. 3, col. (1849), as "*Tritonia aurea*"; Drake in *Edwards' bot. Reg.* 33: t. 61, col. (1847), as "*Tritonia aurea*".

Vern.: Golden Copper-tip (Montbretia). *Distr.*: Indigenous to Africa (Pondoland to Transvaal and S.E. Tropical Africa); introduced into, and often escaping from, gardens of Egypt, N.Z. (frequent in North Id), N.S.W. and Victoria (e.g. Melbourne railway enclosures, Dandenongs etc.), favouring cooler, shaded situations.

Diagn.: Renascent perennial herb with globose, golden-brown corms about 1" wide; leaves 6-12, pale green, distichous, equitant, linear, acuminate, 12-18" long, 10-20 mm. wide or more, thin, flat, with prominent midrib (stem-leaves 2-3, similar but shorter and narrower); inflorescence a compound, branching spike 1-3 ft. high, the axes flattened and often narrowly winged, the ultimate branches flexuose and unilateral with a flower at each angle; flowers each subtended by a pair of dark, ovate, pointed, scarious, gaping, spathe-bracts 4-8 mm. long; perianth fiery orange-red (sometimes all golden), the slightly curved tube 15-20 mm. long, the 6 equal oblongate segments 20-25 × 4-7 mm. and widely spreading; anthers 3, linear, sagittate, versatile, 5-8 mm. long, on slender ± free filaments 30-40 mm. long, and obscurely unilateral; style filiform, ± 30 mm. long, the 3 branches 5-10 mm. long and dilated at extremities; ovary broad, ± 3-4 mm. in diameter, 3-locular with few ovules per loculus; capsule subglobose, 3-lobed, inflated, smooth, shining, 6-10 mm. wide; seeds 3-6, large, 3-4 mm. wide, ± discoid or slightly angular, dark brown, smooth, ± lustrous.

[The name "Montbretia" has often been applied to *C. aurea* (in a monotypic genus), but is more correctly applicable to *Tritonia crocosmiiflora* Lemoine—an intergeneric hybrid between *T. pottii* Benth. and *C. aurea*, having smaller, less spreading corolla-lobes than in the latter. This hybrid, which N. E. Brown treated as a *Crocasmia*, is almost as extensive as the latter parent in Victoria and has also been recorded as naturalized in South Australia (near Murray Bridge); it is figured in the following works—Hegi, *Ill. Flor. Mittel-Eur.* ed. 2, 1: 164 (1931); Degener, *Ferns & Flowering Plant. Hawaii Nat. Park* 1: t. 25 (1930); Bailey, *Standard Cycl. Hort.* new ed., 3: fig. 3852 (1925).]

256. *SPARAXIS Gawl. (1804)

Perianth purplish or variegated with purple and white, occasionally all white or creamy yellow, the throat concolorous:

764. **S. grandiflora* (Delaroche) Gawl. in *Ann. Bot., Lond.* 1: 225 (1804).
Ixia grandiflora Delaroche *Descr. Plant. nov.* 23 (1766).

Illust.: Edwards in *Curtis's bot. Mag.* 20: t. 779, col. (1804), also 15: t. 541, col. (1801) as "*Ixia grandiflora*"; Chittenden, *Dict. Gdng* 4: 1991 (1951); Rice, *Wild Flowers Cape G.H.* t. 184, col. (1951); Dixie in Marloth, *Flor. S. Afr.* 4: t. 43 fig. D, col. (1915); Phillips, *Flowering Plant. S. Afr.* 2: t. 60 (1922);

Makino, *Ill. Flor. Jap.* 649 (1924), as "*S. lineata*"; Loudon, *Ladies' Flower-Gdn ornament. bulbous Plant.* t. 15 fig. 4-5, *col.* (1841); Loddiges, *Bot. Cab.* 11: t. 1085, *col.* (1825); Smith in Sweet, *Brit. Flower Gdn* 5: t. 131, *col.* (1832), as "*S. lineata*"; Edwards' *bot. Reg.* 3: t. 258, *col.* (1818).

Vern.: Harlequin-flower (Wand-flower, Wit Kalossie—Afrikaans). *Distr.*: Indigenous to South Africa; introduced as a garden flower into Victoria where escaping and now widely naturalized in near-coastal parts of the west—e.g. Melbourne Domain, Geelong, Port Fairy, Yambuk (on heavy basaltic soil), Orford, Portland to Hamilton (abundant along both Henty Highway and railway line).

Perianth *tricolorous*—orange, red or purple (rarely white) above, with 3-angled *black blotch* toward centre of each segment, and a bright *yellow throat*:

765. **S. tricolor* (Curt.) Gawl. in *Ann. Bot., Lond.* 1: 225 (1804).

Ixia tricolor Curt. in *Curtis's bot. Mag.* 11: t. 381, *col.* (1797).

Illust.: Edwards in *Curtis's bot. Mag.* 36: t. 1482, *col.* (1812), also 11: t. 381, *col.* (1797) as "*Ixia tricolor*"; Black, *Flor. S. Aust.* ed. 2: fig. 286 (1943); Black, *Naturalized Flor. S. Aust.* 146 (1909); Bailey, *Standard Cycl. Hort.* new ed., 3: fig. 3654 (1925); Thwaites & Dixie in Marloth, *Flor. S. Afr.* 4: t. 40 fig. B, *col.* (1915); Loudon, *Ladies' Flower-Gdn ornament. bulbous Plant.* t. 15 fig. 3, *col.* (1841); Loddiges, *Bot. Cab.* 20: t. 1903, *col.* (1833).

Vern.: Tricolor Harlequin-flower. *Distr.*: Indigenous to South Africa; introduced into gardens whence occasionally escaping in Egypt, N.Z. (Auckland district) N.S.W., S.A. and Victoria—e.g. about Melbourne, Geelong, Creswick cemetery, Dimboola.

[In *Flor. Vict.* 305 (1931) Ewart records *S. bulbifera* (L., ut *Ixia* sp.) Gawl. in *Ann. Bot., Lond.* 1: 226 (1804) as a garden escape since 1909; but there are no Victorian-grown specimens in Melbourne Herbarium to vouch the occurrence of this sulphur-flowered species which is now omitted.]

257. *GLADIOLUS L. (1753)

Leaves *flat*, 5-10 mm. wide; flowers wholly greenish-white, cream or pale pinkish, *not* noticeably fragrant; perianth-tube *very slender* below, 5-7 cm. long, the \pm crinkled lobes 3-5 cm. long, with *recurved acuminate* tips:

766. **G. cuspidatus* N. J. Jacq. *Icon. Plant. rar.* 2⁵: t. 257 (1789).

Illust.: Jacquin (*l.c.*); Edwards in *Curtis's bot. Mag.* 16: t. 582, *col.* (1802); Black, *Flor. S. Aust.* ed. 2: fig. 285 (1943); Ewart, *Flor. Vict.* fig. 150 (1931); Bolus, *S. Afr. Gdn & Ctry Life* 21: 75 (1931); Loudon, *Ladies' Flower-Gdn ornament. bulbous Plant.* t. 10 fig. 4, *col.* (1841).

Vern.: Wild Gladiolus. *Distr.*: Indigenous to South Africa; introduced into and escaping from gardens in N.S.W., S.A. and Victoria where now a widespread weed of cooler parts, and locally frequent (e.g. Melbourne region, Mornington, Geelong, Meredith, Anglesea, Warrnambool, Wannon Falls, Creswick, Bendigo, Dunolly, Ovens R., Yackandandah, Wonthaggi).

Leaves \pm *terete* (or very narrow-linear and boldly ribbed), <3 mm. wide; flowers cream to yellowish, with conspicuous *purple-brown* or *blackish veinings*, sweetly fragrant at night or on dull days; perianth-tube *broadish*, 4-5 cm. long, the lobes 2-3 cm. long and *acute* (but not acuminate):

767. **G. tristis* L. *Spec. Plant.* ed. 2, 1: 53 (1762).

G. grandis sens. Ewart *Flor. Vict.* 306 (1931), non Thunb. (? 1800).

Illust.: Curtis's bot. Mag. 8: t. 272, col. (1794); Herter, *Flor. il. Uruguay* 1: fig. 962 (1943); Bailey, *Standard Cycl. Hort.* new ed., 2: fig. 1648 (1925); Barker in Creasey, *J. bot. Soc. S. Afr.* 23: t. 4 opp. 11 fig. 6 (1937); Phillips, *Flowering Plant. S. Afr.* 5: t. 175 (1925); Thwaites & Dixie in Marloth, *Flor. S. Afr.* 4: t. 46 fig. D, col. (1915); Ashley in C. H. C., *Gdnrs' Chron.* ser. 3, 65: 148-149 (1919) *Garden* 75: 420 (1911).

Vern.: Evening-flower *Gladiolus* (Avon-flower). *Distr.*: Indigenous to South Africa; introduced into S. Amer. and Victoria where now a widespread, locally common weed, proclaimed as noxious for Cranbourne Shire and part of Broadmeadows Shire—also noted in Dimboola, Natimuk, Maroona, Ballarat, Warrnambool, Geelong, Sandringham, Eltham, and Stratford districts.

[A well-known hybrid between *G. tristis* and *G. cardinalis* Curt. (1790) is *G. colvillei* Sweet (1824-29)—a plant with bright red flowers, the 3 lower segments each ornamented with a long-angular yellow blotch. It is the oldest of garden hybrid gladioli and sometimes escapes from cultivation in Victoria (e.g. at Myrtleford, Dec. 1953).]

258. **FREESIA* Eckl. in Klatt (1866)768. **F. refracta* (N. J. Jacq.) Klatt in *Linnæa* 34: 673 (1866).

Gladiolus refractus N. J. Jacq. *Icon. Plant. rar.* 2^a: t. 241 (1789).

Illust.: Jacquin (*l.c.*); Hutchinson, *Fam. Flowering Plant.* ed. 2, 2 (Monocotyledons): fig. 396 (1959); Herter, *Flor. il. Uruguay* 1: fig. 961 (1943); Hegi, *Ill. Flor. Mittel-Eur.* ed. 2, 7: 165 (1931); Bailey, *Manual cult. Plant.* rev. ed.: fig. 37c (1949); Bailey, *Standard Cycl. Hort.* new ed., 2: fig. 1578-79 (1925); Britton, *Flor. Bermuda* 85 (1918); Phillips, *Flowering Plant. S. Afr.* 1: t. 11 (1921); *Garden* 80: 133 (1916); Loudon, *Ladies' Flower-Gdn ornament. bulbous Plant.* t. 16 fig. 2, col. (1841), as "*Tritonia refracta*".

Vern.: Common *Freesia*. *Distr.*: Indigenous to South Africa; introduced as a garden flower into many countries and occasionally escaping in W. Indies, S. Amer., Egypt and Victoria—Melbourne Domain, suburban gardens and cemetery enclosures.

Diagn.: Renascent perennial herb with narrowly ovoid, smooth brown corms 10-15 mm. wide; leaves narrowly lanceolate to linear, acuminate, 4-10" long, 5-10 mm. wide, few (4-8), thin, pale green, distichous and equitant, with 3-5 prominent nerves and several fainter striations; inflorescence a slender, simple or sparingly branched spike to 1 ft. high (usually 5-9"), the terminal flower-bearing part sharply bent into a horizontal position, with few (3-8) flowers arranged pectinately along the upper side; perianth creamy-white with yellow tints in throat and toward base, trumpet-shaped, slightly curved below, 1.5-2" long, springing from a pair of scarious, elliptical, blunt, striated spathe-bracts 6-12 mm. long, the tube 15-35 mm. long and very slender in lower half, the 6 equal perianth-lobes blunt, broadly elliptical, 10-15 × 5-8 mm.; anthers 3, linear, ± 6 mm. long, versatile on filiform unilateral filaments (20-30 mm. long) attached below middle of tube; style filiform, as long as perianth, divided near apex into 3 spreading arms (3-5 mm. long) which are each deeply bifid, the 6 ultimate stigmatic lobes being linear-cuneate and 2-3 mm. long; ovary 3-5 mm. long, ovoid to barrel-shaped, 3-locular, with many ovules per loculus; capsule ovoid-oblong, 10-15 mm. long, bluntly trigonous, greenish, wrinkled and finely cristate-tuberculate all over, many-seeded; seeds relatively very large, ± oblong, 3-5 × 2-3 mm., highly lustrous, dark reddish-brown, globoid and finely wrinkled in one half, smooth and flattened at other end.

259. **WATSONIA* Mill. (1759)

Flowers *brick-red to salmon-pink*; perianth-tube 4-6 cm. long, the upper part remaining *cylindrical*; stamens (and style) *arched* under the uppermost perianth-lobe (lower spathes of inflorescence frequently bearing *clusters of bulbils* instead of flowers):

769. **W. bulbifera* J. W. Mathews & L. Bolus in *Ann. Bolus Herb.* 3: 140 (1922).

W. meriana sens. Ewart *Flor. Vict.* 304 (1931), atque auctt. *Vict.*, *non* (L., ut *Antholyza* sp.) Mill. (1768).

Illust.: Davey, *J. Dep. Agric. Vict.* 21: 232-233 (1923), as "*W. meriana*".

Vern.: Bulbil *Watsonia* (Merian's Bugle Lily). *Distr.*: Indigenous to South Africa; introduced and naturalized in W.A. (where by far the most widely ranging and troublesome of 5 *Watsonia* spp.), ?S.A., and Victoria where a widespread increasing weed, often growing to the exclusion of all other vegetation on moist creek-flats and, under the name of "*W. meriana*", proclaimed as noxious for the whole State (e.g. Harrow, Hawkesdale, Ararat, Beaufort, Dunolly, Waubra Junct., Geelong, Mornington, eastern suburbs of Melbourne, Dandenongs, Seymour, Euroa, Bairnsdale).

[At least part of the population collectively referred to *W. meriana* in J. M. Black's *Flor. S. Aust.* ed. 2: 202 (1943) most probably belongs to *W. bulbifera*. This species, together with *W. leipoldtii* L. Bolus (1932) and others, has been segregated from *W. meriana* (in the strict sense) which lacks bulbils and possesses much larger perianth-lobes (1" long or more). The Victorian weed is identical in every respect with Western Australian material determined as typical *W. bulbifera* at Kew Herbarium in 1938.]

Flowers pale to deep rose-pink, or white; perianth-tube 2-3 cm. long, the upper part widely *funnel-shaped*; stamens *not* arched (spathes *never* bearing bulbils):

770. **W. pyramidata* (Andr.) Klatt in Durand & Schinz *Consp. Flor. Afr.* 5: 194 (1895).

Gladiolus pyramidatus Andr. *Bot. Repos.* 5: t. 335, col. (1803).

Illust.: Andrews (*l.c.*); Edwards in *Curtis's bot. Mag.* 27: t. 1072, col. (1807); Marloth, *Flor. S. Afr.* 4: fig. 49 (1915); *Garden* 77: 484 (1913)—all except Andrews as "*W. rosea*".

Vern.: Rosy *Watsonia*. *Distr.*: Indigenous to South Africa; introduced as a garden flower into many parts of the world, including Victoria, and occasionally persisting about old estates or along railway enclosures in the Melbourne suburban area, country cemeteries etc., but not truly naturalized as it is in south-western W.A. The species has been hybridized with others, resulting in a large assortment of attractive colour forms.

[Several other South African members of *Iridaceæ* are occasional garden escapes in Victoria, notably: *Pentamenes æthiopica* (L.) E. P. Phillips (African Corn-flag or Mad-flower), a tall stiff nectiferous perennial with broadish leaves and numerous long-tubular, decurved, claw-like, red-and-yellow flowers in long but compact, distichous spikes (sometimes branched); *Babiana stricta* (Ait.) Gawl. (Erect Baboon-flower), a lax plant to 1 ft. high with pleated, velvety-pubescent foliage and 2-10

regular mauve to deep purple flowers in a loose spike; *Hexaglottis virgata* (N. J. Jacq.) Sweet, having small yellow flowers in chiefly imbricate clusters on the long rigid branches of an inflorescence 1-3 ft. high; and *Moræa aristata* (Houtt.) Aschers. & Græbn. (Blue-eyed Iris), with single leaf and a few white flowers with striking blue centres. The last appeared at Coleraine in Nov. 1945; but the other species have been observed (chiefly about the Melbourne suburbs) for a much longer period, and *Hexaglottis* now seems to have died out from the King's Domain. *Moræa vegeta* L. and *M. bicolor* (Lindl.) Steud. are vigorous, tough, rhizomatous plants, occasionally persisting in old gardens; the former has white-and-blue flowers, the latter cream-yellow flowers heavily blotched with brown on each sepal, and both are sometimes assigned to the derivative genus *Dietes*. Also South African, *Ferraria undulata* L. (Black Flag) sometimes persists in and around old gardens, a large patch being noted as spontaneous on the coast at St. Leonards in Sept. 1960. This remarkable cormogenous plant has a flattened panicle 6-12" high, with many large, overlapping, erect, green spathe and fugitive malodorous flowers that resemble brownish-purple starfish to 2" wide; the six equal spreading segments are dull green and highly crisped along their margins.]

Family 59. BURMANNIACEÆ

260. THISMIA W. Griff. (1845)

771. *T. rodwayi* F. Muell. in *Vict. Nat.* 7: 115 (1890).

Illust.: McLennan, *Aust. J. Bot.* 6: t. 1 opp. 36 (1958); Coleman, *Vict. Nat.* 57: t. 18 (1941), also 52: 163 & t. 19 (1936) as "*Sarcosiphon rodwayi*"; Rodway, *Tasm. Flor.* t. opp. 209 (1903); Smith in Cheeseman, *Ill. N.Z. Flor.* 2: t. 191 fig. A (1914), as "*Bagnisia hillii*".

Vern.: Fairy Lanterns. *Distr.*: Localized, concealed and very rarely observed in Victoria where restricted to damp humus (flowering sometimes underneath the litter) and tree-fern butts in shaded forest fern gullies (Sherbrooke Forest in Dandenongs, Narbethong, Tarra Valley Nat. Park, ?Goræ West near Portland where now presumed extinct); also Tas. (Mt. Wellington) and N.Z. (Opepe, 15 miles east from Lake Taupo).

Diagn.: Small, \pm subterranean, leafless saprophyte, with creeping, vermiform and mycorrhizal root-system 2-6" long; stems erect, simple, 1-flowered, 10-30 mm. long, bearing \pm 6 white scale-like bracts (those immediately under terminal and erect flower larger, sometimes coarsely toothed, 5-10 mm. long); perianth 12-18 mm. long, 7-10 mm. wide, mitre- or lantern-shaped, amber-and-red to rosy-pink or flesh-coloured, very brittle; perianth-tube 6-8 mm. long, 4-6 mm. wide above, \pm urceolate, suddenly narrowed toward base, bearing 12 vertical coloured stripes (6 strong, 6 faint); perianth-lobes 6, in 2 series, each 4-6 mm. long, the outer 3 narrowly ovate, \pm recurved, slightly shorter and broader than inner lobes which are lanceolate, arched inwards and tightly connivent just below the 3 free erect or spreading tips (leaving 3 elliptical windows or openings in the crown of the flower); stamens 6, hanging from a 6-lobed annulus at summit of perianth-tube, the short red filaments contrasting with the enormously dilated pale connectives (3-4 mm. long) which arch over and conceal the minute anthers; style confined to base of flower, \pm 1 mm. long, with 3 spreading or ascending, 2-lobed stigmas each \pm 2 mm. long; ovary colourless, inferior, shortly obovoid, \pm 3 mm. long, 1-locular, with 3 parietal placentas and numerous microscopic ovules; fruit and mature seeds unknown.

[This rare and highly remarkable plant affords one of the most interesting examples of disjunct and isolated distribution in a predominantly tropical genus. It has been variously assigned to the genera *Bagnisia* and *Sarcosiphon*, both of which were included under *Thismia* in F. P. Jonker's "Monograph of the *Burmanniaceæ*", *Med. bot. Mus. Rijksuniv. Utrecht* 51: 248-254 (1938). More recently *Thismia*, with eight other genera, has been removed from the *Burmanniaceæ* and placed in a distinct family *Thismiaceæ* by J. Hutchinson in his *Fam. Flowering Plant. ed. 2*, 2 (Monocotyledons): 687-689 (1959).]

Family 60. ORCHIDACEÆ

1. Plants *epiphytic* or *lithophytic*; leaves *tough and leathery*; inflorescence *arched* or *pendulous*, \pm *lateral* to the main axis (orchids of East Gippsland, Strzelecki, Dandenong and Otway Ranges) 21
Plants *terrestrial* (or sometimes on tree-fern trunks); leaves *not* leathery; inflorescence *erect*, *terminating* the main axis 2
2. Flowers *not* "inverted" on the scape; labellum always *below* the column 7
Flowers always "inverted", so that the labellum lies *above* the column 3
3. Labellum-claw *very short* and *inconspicuous*; lamina *never* peltate 5
Labellum highly modified, with a movable, *slender*, *strap-like* claw (articulate on the long column-foot) and a variously-shaped *peltate* lamina (flowers of late spring and summer) 4
4. Leaves *linear*, *reddish*; column broadly winged for its *entire* length; labellum-lamina *ovate*, without caudicles (whole flower reddish-brown, often reminiscent of a *duck in flight*) 267. *Caleana*
Leaves *pale green* or *absent*; column with wing-like auricles *above* the middle; labellum-lamina *narrow*, with *caudiform* appendages 268. *Spiculæa*
5. Labellum 1.5 cm. long or more, much *larger and broader* than all other segments (leaf-blades *ovate* to *elliptic*) 278. *Cryptostylis*
Labellum *never* attaining 1.5 cm., *not* differing markedly in size and shape from other segments 6
6. Leaf *absent*; flowers *pendent*, *pedicellate*, brown-and-white, *bell-like* (with fused perianth-segments) 280. *Gastrodia*
Leaf *solitary*, *terete*, sheathing the scape; flowers usually \pm *erect*, almost *sessile*, with *free* segments (often minute) 266. *Prasophyllum*
7. Perianth-segments always *exceeding* 5 mm. 9
Flowers *very small* (perianth-segments up to 5 mm. long) 8
8. Leaf *solitary*, *terete*, sheathing the scape for at least half its length; flowers *green* or *yellowish*, *not* spirally arranged 265. *Microtis*
Leaves *several*, *linear*, basal; flowers *pink-and-white*, close-set in a conspicuous spiral around the scape 281. *Spiranthes*
9. Flowers conspicuously *hood-shaped*, green or reddish, *pedunculate*; dorsal sepal and lateral petals *cohering* for their whole length; labellum relatively *small*, *mobile*, with a basal appendage 279. *Pterostylis*
Flowers *hood-shaped*, *solitary* and relatively large, purplish, almost *sessile* on the single epigeal leaf; dorsal sepal and *immobily* labellum *enlarged* and \pm *cohering*, the other segments *minute* 277. *Corybas*

- Flowers variously coloured, *rarely* hood-shaped and, if so, then *not* solitary and the labellum neither mobile *nor* appendiculate at base 10
10. Perianth almost actinomorphic, the labellum *similar* to other segments (column variously ornamented with hair-tufts or papillate lobes) 261. *Thelymitra*
Perianth zygomorphic, the labellum usually *much modified* (column without hair-tufts) 11
11. Lateral sepals *not* differing markedly in shape or length from the dorsal one. 14
Lateral sepals much *larger than* all other segments, deflexed, white or pink; labellum much *recurved* (leaf ovate, usually absent at flowering time) 271. *Eriochilus*
Lateral sepals much *narrower and longer* than the dorsal one, brown or greenish; labellum almost straight 12
12. Leaf *solitary* (rarely 2), ovate; labellum with wide, *reddish-purple fringe* (flowering autumn and winter) 274. *Leptoceras*
Leaves *several*, linear; labellum-margins *entire* 13
13. Flowers *brightly coloured* (yellow, purple or whitish), on *slender pedicels*; petals well-developed, *clawed* 263. *Diuris*
Flowers *greenish-brown*, almost *sessile*; petals *minute*, *sessile*; lateral sepals *erect*, extremely long and \pm filiform 264. *Orthoceras*
14. Labellum much *longer than* all other segments, densely covered with brown to reddish-purple hairs or papillæ (rarely smooth, as in *C. imberbis*) 262. *Calochilus*
Labellum *no longer than* other segments, usually shorter 15
15. Leafless *saprophyte*, with fleshy brownish scape and showy, *spotted* pink or whitish flowers 283. *Dipodium*
Plants *non-saprophytic*; leaves *present* (at least after flowering); flowers *without spots*, except occasionally on labellum or column 16
16. Labellum variously *fringed*, *hairy* or *glandulose*; leaves 1-several 18
Labellum entirely smooth and undivided (1 or 2 glands sometimes at very base); leaf solitary 17
17. Leaf very *hairy*; flower *solitary*, *bright purplish* or *white*; column broadly winged 276. *Glossodia*
Leaf *glabrous*; flowers usually *several*, *greenish-brown* or *dark red*; column almost wingless 270. *Acianthus*
18. Leaves 2, radical, usually \pm *petiolate*; flower solitary, green or reddish-brown; labellum *entire*, with *dark waxy calli* 269. *Chiloglottis*
Leaf *solitary*, or, if several and bract-like, then always stem-clasping *and* the labellum without dark calli 19
19. Leaves 1 or 2, veined in red; labellum with a wide *reddish-purple fringe*, but no papillæ or calli on the lamina (flowering autumn and winter) 274. *Leptoceras*
Leaves reduced to a few *sheathing purplish bracts*; flowers several, white within, *opening very tardily*; labellum with 2 longitudinal ridges that break up into pale calli 273. *Burnettia*
Leaf *solitary*, *without red veins*; labellum fringed or entire, but its lamina always *provided with papillæ or calli* of some kind 20

20. Leaf glabrous; floral bracts *large*, exceeding the ovaries; column-wings *very narrow* or obsolete; labellum *sessile* 272. *Lyperanthus*
 Leaf usually hairy; floral bracts small, not longer than ovaries; column *broadly winged*; labellum often on a *movable claw* 275. *Caladenia*
21. Lateral sepals dilated at base and *united with the column-foot* to form a pouch-like mentum; labellum *without* any spur 282. *Dendrobium*
 Lateral sepals *free*, not forming a mentum; labellum with a prominent *spur or deep pouch* 22
22. Roots mostly creeping *on bark* of host; perianth 10 mm. long or more; spur *solid*, *without* an appendage 285. *Sarcochilus*
 Roots mostly hanging *in the air* and very long; perianth < 6 mm. long; spur *hollow*, with a ciliate *appendage almost closing the orifice* 284. *Thrixspermum*

[No attempt is made here to give tribal names to the various groupings of genera, for authorities still differ in their delimitations of the higher categories in this very large and complex family—for instance, whether a particular taxon should be classed as “series”, “subtribe”, “tribe” or even “supertribe”—and many of the suprageneric names used in orchidological publications have *never* been defined at all, in conformity with the requirements of the International Code of Botanical Nomenclature (see G. P. De Wolf, Jr., “Primary Classification in the Orchidaceæ” in *Taxon* 5³: 46-53, May 1956). In *Ann. Mo. bot. Gdn* 47: 25-68 (Feb. 1960), under the title “Classification and Phylogeny in the *Orchidaceæ*”, R. L. Dressler & C. H. Dodson have lately reviewed the tribal and subtribal nomenclature of orchids, bringing it into line with the international rules. They recognize only about 40 subtribes (cf. 80 in Schlechter’s arrangement) and, inter alia, synonymize *Caladeniinae* Pfitz., *Thelymitrinae* Pfitz., *Acianthinae* Schlechter and *Corysanthinae* Schlechter under *Chloraiinae* Pfitz.—based on the Chilean genus *Chloraea*.

The following sequence of orchid genera has been adopted from that used by H. M. R. Rupp in *Orchids of New South Wales*, 1943, which was based on E. Pfitzer’s arrangement in *Natürlichen Pflanzenfamilien* II⁶ (1889), with later slight modifications by R. Schlechter. An exception to Rupp’s grouping is the restoration of the genus *Calochilus* to its position alongside *Thelymitra* (in subtribe *Thelymitrinae*), where it was placed by Schlechter (*Notizbl. bot. Gart. Berl.* 9: 583, July 1926) with good reason.]

261. THELYMITRA Forst & Forst. f. (1776)

1. Lateral lobes or appendages of column *without* hair-tufts, but sometimes papillate or laciniate (rarely absent) 13
 Lateral lobes of column bearing distinct *brush-like tufts of hair* 2
2. Hair-tufts of column variously coloured 9
 Hair-tufts always *white* 3
3. Mid-lobe of column *abbreviated* and usually crested 7
 Mid-lobe of column *conspicuous*, long and often tubular 4
4. Mid-lobe of column *broadly dilated*; leaves various 6
 Mid-lobe of column *narrow and tapering upwards*; leaves large and fleshy (usually \pm 2 cm. wide) 5
5. Hair-tufts almost *erect*, usually *exceeding the mid-lobe* which is bifid and denticulate but *not* deeply divided; perianth-segments 13-20 mm. long, pale but *clear blue* or *purplish*:

772. *T. grandiflora* R. D. FitzG. in *Gdnrs' Chron.* new ser. 17: 495 (1882).

Illust.: Nicholls, *Orchids Aust. 1*: t. 18 & 19, col. (1951); FitzGerald, *Aust. Orchids* 2³: t. col. (1888); Fiveash in Rupp, *Aust. Encycl.* 6: 412 B fig. 3, col. (1958); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Nicholls in Barrett, *Aust. Wild Flower Book* t. opp. 149 (1942); Nicholls in Barrett, *Sun Nature Book* n. 5: 15, 56 col. (1934); Green, *Vict. Nat.* 50: t. 37 (1934); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: frontisp. [3], col. (1911).

Vern.: Great Sun-orchid. *Distr.*: Widely distributed throughout southern Victoria excepting on open plains and agricultural land, but rather uncommon, extending from coastal heaths and foothill forests to subalpine heights in far East Gippsland (e.g. Lower Glenelg R., Portland, Grampians, Otways, Brisbane Range, Creswick, Hepburn, Blackwood-Macedon area, Arthur's Seat, Strzelecki Range, Wonthaggi, Hedley, Alberton, Marlo, between Tonghi and Cann R., Bonang); also S.A., Tas.

—Hair-tufts short and horizontal, exceeded by the tripartite mid-lobe; perianth-segment 10-15 mm. long, greenish-blue or bronzy, with an almost metallic lustre:

773. *T. epipactoides* F. Muell. *Fragm. Phyt. Aust.* 5: 174 (1866).

Illust.: Nicholls, *Orchids Aust. 1*: t. 15, col. (1951); Nicholls in Barrett, *Sun Nature Book* n. 5: 13 (1934); Ewart, Rees & Wood, *Proc. roy. Soc. Vict.* new ser. 24: t. 23 opp. 74 (1911); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 33: t. 19 (1909), also *Introd. Study S. Aust. Orchids* ed. 2: 36 (1911).

Vern.: Metallic Sun-orchid (Stout Sun-orchid). *Distr.*: Localized and becoming rare in Victoria where confined to Lawloit, the Grampians and a few coastal heaths (near Childers Cove, Bellbrae, Ocean Grove, Point Lonsdale, Black Rock where now presumed extinct, Hedley and Yarram in South Gippsland); also S.A. (between Murray R. mouth and Mt. Lofty Range, also Tintinara).

6. Mid-lobe of column deeply cleft, often yellow toward apex; hair-tufts usually white, terminal on \pm erect lateral lobes (perianth-segments expanding only in very hot weather, showing wide variations in length and colour—<1 cm. to 2 cm. long; white, pink, pale blue-green or purplish):

774. *T. pauciflora* R.Br. *Prodr. Flor. Nov. Holl.* 314 (1810).

Illust.: Nicholls, *Orchids Aust. 1*: t. 30-34, col. (1952); FitzGerald, *Aust. Orchids* 1⁶: t. col. (1880); Erickson, *Orchids of the West* 18 fig. 10 (1951); Nicholls in Barrett, *Sun Nature Book* n. 5: 14 (1934); Green, *Vict. Nat.* 46: t. 8 (1928); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 9 (1911); Hatch, *Trans. roy. Soc. N.Z.* 79: t. 80 fig. K-M (1952); Nicholls, *Orchidologia zeylan.* 2: t. opp. 153 fig. F-H (1935).

Vern.: Slender Sun-orchid. *Distr.*: Described by W. H. Nicholls (1952) as "the commonest sun-orchid throughout Australia", and certainly a widespread frequent species in Victoria where it occurs over a wide range of country from the Lower Glenelg R. to Cann R. and the north-eastern mountains (but absent from alps, northern plains, Mallee districts and heavily grazed or cultivated tracts); all States, N.Z.

[The var. *holmesii* (W. H. Nicholls 1933, ut sp.) W. H. Nicholls in *Vict. Nat.* 60: 56 (1943) has deep violet flowers with large hood and yellowish hair-tufts. It is known only from the Portland district, Vic., and is illustrated by Nicholls in *Orchids Aust. 1*: t. 30 fig. m-n, col. (1952), also in *Vict. Nat.* 49: 262 (1933).]

- Mid-lobe of column *entire or almost so*, chiefly nigger-brown or dark purple; hair-tufts white and secund on upper side of the \pm *horizontal* lateral lobes (like miniature scrubbing brushes); leaves mostly broad-lanceolate:

775. *T. aristata* Lindl. *Gen. & Spec. orchid. Plant.* 521 (1840).

T. longifolia sens. Ewart *Flor. Vict.* 331 (1931), *non certe* Forst. & Forst. f. (1776).

Illust.: Nicholls, *Orchids Aust. I*: t. 24, *col.* (1951), also t. 25-27, *col.* (1952); FitzGerald, *Aust. Orchids I*^b: t. *col.* (1879); Nicholls, *Aust. Orchid Rev.* 21: 22 (1956); Erickson, *Orchids of the West* 18 fig. 8 (1951); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 296 i (1943); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Nicholls, *Wild Life* 9: 381 (1947); Reeves, *Wild Life I*: 20 (Oct. 1938); Nicholls in Barrett, *Sun Nature Book* n. 5: 14 (1934), also n.1: 23 fig. 16 *col.* (1932); Nicholls, *Vict. Nat.* 51: t. 27 (1934), also 46: 31 fig. 6-8 (1929); Green in Pescott, *Vict. Nat.* 50: t. 36-37 (1934), as "*T. longifolia*"; Green, *Vict. Nat.* 46: t. 8 (1930); Pescott, *Vict. Nat.* 43: t. 9 (1926); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 103 fig. A, *col.* (1858), as "*T. nuda*"; Meredith, *Bush Friends Tasm.* t. 3, *col.* (1860), as "*T. nuda*"; Hatch, *Trans. roy. Soc. N.Z.* 79: t. 79: fig. M-N (1952).

Vern.: Scented Sun-orchid. *Dist.*: Except for densely forested areas, the alps and cultivated land, scattered almost throughout Victoria and often abundant on rather marshy ground (e.g. in such widely dispersed localities as Portland, Grampians, Little Desert, Far North-west, Ararat, Otways, Brisbane Range, Creswick, Bendigo, Tallarook, Rushworth, Nathalia, Timbertop near Mansfield, Granya, Cravensville, St. Albans-Sydenham region on basaltic grassland where now rare, Dandenongs, Quail Id in Western Port, Wonthaggi, Wilson Prom., Deddick R. & Tubbut); temperate parts of all States, N.Z.

[The var. *megcalyptra* (R. D. FitzG., *ut sp.*) W. H. Nicholls in J. M. Black *Flor. S. Aust.* ed. 2: 215 (1943) has a large and unusually inflated column-hood; but, even in the one area, transitions to the typical form may be found. It occurs chiefly in western Victoria (Grampians, Whipstick Scrub near Bendigo, etc.), also in South Australia and New South Wales (Tamworth, Mt. Kaputar, etc.), and is portrayed in the following illustrations—FitzGerald, *Aust. Orchids I*^b: t. *col.* (1879); Green, *Vict. Nat.* 50: t. 38 (1934), also 46: t. 8 (1930).]

- As for the last, but mid-lobe largely *yellow*, the ascending lateral lobes with *terminal* (sometimes pink or lilac) hair-tufts and leaves narrow-lanceolate:

776. *T. nuda* R. Br. *Prodr. Flor. Nov. Holl.* 314 (1810).

Illust.: Nicholls, *Orchids Aust. I*: t. 28, *col.* (1952); FitzGerald, *Aust. Orchids I*^b: t. *col.* (1879); Erickson, *Orchids of the West* 18 fig. 9 (1951); Nicholls, *Vict. Nat.* 50: 237 (1934); Nicholls in Barrett, *Sun Nature Book* n. 5: 13 (1934).

Vern.: Plain Sun-orchid. *Dist.*: Localized and rare in Victoria where known with certainty only from Bannockburn (Oct. 1933), Lawloit Range near Nhill (Oct. 1951) and Wilkin near Casterton (Oct. 1960); apparently all States except S.A. but of very discontinuous range and seldom observed.

[The interpretation of *T. nuda* by W. H. Nicholls (*l.c.*) differs significantly from that by H. M. R. Rupp in *Orchids N.S.W.* 9 (1943) where the column-hood is described as very *deeply bifid* and the hair-tufts as *horizontal*. *T. aristata* is so highly

variable in size and colour that the differences purporting to separate it from *T. nuda*, *T. pauciflora* and even *T. longifolia* Forst. & Forst. f. (of New Zealand) are by no means always clear-cut. If it is ever generally agreed to unite all these populations under one name (as Bentham did with the last three), then *T. longifolia* must take precedence.]

7. Perianth mauve or bluish, usually *spotted*; mid-lobe of column *densely crested*, tripartite but varying from slightly to noticeably cleft:

777. *T. ixioides* Swartz in *K. svenska VetenskAkad Handl. ser. 2*, 21: 228 t. 3 (1800).

T. merranæ W. H. Nicholls in *Vict. Nat.* 46: 139 *cum icon.* (1929).

Illust.: Swartz (*l.c.*); Nicholls, *Orchids Aust. 1*: t. 3-7, *col.* (1951). FitzGerald, *Aust. Orchids 2³*: t. *col.* (1888); Erickson, *Orchids of the West* 18 fig. 1 (1951); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Scammell in Rupp, *Orchids N.S.W.* t. 2 opp. 6 (1943); Nicholls, *Vict. Nat.* 60: 57 fig. E-Q (1943), also 46: 31 fig. 10-12, 14 (1929); Nicholls in Barrett, *Sun Nature Book n. 5*: 13 (1934); Green, *Vict. Nat.* 46: t. 8 (1930); Pescott, *Orchids Vict.* t. opp. 17 (1926); Sulman, *Aust. Wild Flowers ser. 2*: t. 39 (1913); Rodway, *Some Wild Flowers Tasm.* t. on 101 (1910); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 103 fig. B, *col.* (1858); Hatch, *Trans. roy. Soc. N.Z.* 79: t. 78 fig. G-H (1952); Nicholls, *Orchidologia zeylan.* 2: t. 156 (1935).

Vern.: Dotted Sun-orchid. *Distr.*: Except for Mallee, northern plains, alps, heavily forested country and agricultural land, a widely ranging and locally common orchid in Victoria (e.g. Lower Glenelg R., Little Desert, Grampians, Mt. Cole, Whipstick Scrub near Bendigo, Otways, Kinglake Nat. Park, Dandenongs, Arthur's Seat, Tallarook, Graytown, Timbertop near Mansfield, Barry Mtns., Wilson Prom., and frequent in coastal districts of East Gippsland); all States, N.Z., N. Cal.

[The var. *subdifformis* W. H. Nicholls in *Vict. Nat.* 61: 207, 209 fig. N (1945) differs in having very narrow, *wholly green* sepals; it is known only from Portland and Blackburn in Victoria. The var. *truncata* (R. S. Rogers, *ut sp.*) W. H. Nicholls in *Vict. Nat.* 60: 55 (1943) is distinguished by its small size, *entire and conspicuously truncate* mid-lobe to the column. Victorian localities include Maryborough, Gisborne district, Brisbane Range, Boronia, Cravensville near Tallangatta and Gillingal near Buchan; this variety is also recorded from Myponga, in South Australia, and is portrayed in the following illustrations—Nicholls, *Orchids Aust. 1*: t. 7 fig. a-d & f-i, *col.* (1951); Nicholls, *Vict. Nat.* 47: 124 fig. a-h (1931); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 41: t. 17 (1917).]

—Perianth *without spots*; mid-lobe of column *sparsely* and irregularly crested, tripartite and very deeply cleft

8. Perianth pale to deep blue (rarely pink); column with a conspicuous collar-like *band of colour* below the lobes (plant of damper forest areas):

778. *T. media* R. Br. *Prodr. Flor. Nov. Holl.* 314 (1810).

T. canaliculata sens. Ewart *Flor. Vict.* 329 (1931), *non certe* R. Br. (1810)—typus W.A.

Illust.: Nicholls, *Orchids Aust. 1*: t. 8-11, *col.* (1951); FitzGerald, *Aust. Orchids 1⁴*: t. *col.* (1878), also 2³: t. *col.* (1888) as "*T. canaliculata*"; Nicholls in Barrett, *Sun*

Nature Book n. 5: 14 (1934); Green, *Vict. Nat.* 46: t. 8 (1930); Nicholls, *Vict. Nat.* 46: 31 fig. 1 & 16-21 (1929); Nicholls, *Orchidologia zeylan.* 2: t. opp. 158 (1935).

Vern.: Tall Sun-orchid. *Distr.*: Scattered through sothern and eastern Victoria where locally abundant along deep-soiled, well-watered forest valleys, tolerating damper shadier conditions than most species (e.g. Portland district, Stawell, Creswick where rare, Riddell, Brisbane Range, Arthur's Seat, Dandenongs, Kinglake, Healesville, Beenak & Gembrook where sometimes showing 20-30 open flowers per spike, Strzelecki Range, Yarram, Mt. Cobbler, Barry Mtns., Combienbar, Bonang); Tas., N.S.W., ?W.A., ?N. Cal.

[The var. *carneo-lutea* W. H. Nicholls in *Vict. Nat.* 60: 56, 57 fig. A-D (1943) is a glaucescent plant with *flesh-pink* perianths; it is known only from Tynong North in West Gippsland.]

—Perianth deep blue to purple; column *without* any distinctive colour-band (rare plant of western Victoria, chiefly in mallee formation):

779. *T. azurea* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 41: 342, t. 17 (1917).

Illust.: Fiveash in Rogers (*l.c.*), Nicholls, *Orchids Aust.* 1: t. 12, col. (1951); Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. 0, col. (1934); Nicholls, *Vict. Nat.* 49: 223 fig. c, h & i (1933).

Vern.: Azure Sun-orchid. *Distr.*: Confined in Victoria to dry scrubland of the far west and uncommon (Grampians, Little Desert, Yanac); also Tas., S.A. (between Mt. Compass and Victor Harbour).

9. Hairs on the column-lobes *few and reddish*; stigma *apical*, with long *sac-like base* (outer perianth-segments variegated with *deep crimson*, the inner *purplish-blue*):

780. *T. murdochæ* W. H. Nicholls in *Vict. Nat.* 50: 219, t. 35 col. (1934).

Illust.: Nicholls (*l.c.*); Nicholls, *Orchids Aust.* 1: t. 36, col. (1952); Nicholls in Barrett, *Sun Nature Book* n. 5: 15 (1934).

Vern.: Wonthaggi Sun-orchid. *Distr.*: Endemic in Victoria where extremely localized and rare, being known only by the type collection from heathland between Wonthaggi and Inverloch (Nov. 1933).

—Hairs on column-lobes *numerous*, forming *mauve or purplish tufts*; mid-lobe very deeply cleft and *tripartite*; stigma *basal* (perianth *not* variegated, either deep blue or purple):

T. azurea R. S. Rogers [See No. 779].

—As for the last, but mid-lobe of column *almost entire* (never tripartite):

T. nuda R. Br. [See No. 776].

—Hairs on column-lobes forming *dense yellow tufts*; stigma *basal* 10

10. Mid-lobe of column *short and truncate* or absent 12

Mid-lobe of column *conspicuous and tubular* 11

11. Mid-lobe an *elongated hood* with *entire* margins; perianth violet, opening tardily:

T. pauciflora R. Br. [See No. 774].

—Mid-lobe \pm *globular and entire*; perianth pale pink, opening freely:

781. *T. chasmogama* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 51: 4 (1927).

Illust.: Nicholls, *Orchids Aust.* 1: t. 21, col. (1951); Nicholls, *Vict. Nat.* 56: 64 fig. A-E (1939), also 63: 127 fig. D-F (1946).

Vern.: Globe-hood Sun-orchid. *Distr.*: Localized and rare in Victoria, where known with certainty from only six localities, viz. Lawloit Range near Nhill (Oct. 1951), Devil's Garden at Pomonal (Oct. 1932), Ararat (Oct. 1945), Whipstick Scrub near Bendigo (Oct. 1947), Moe (Nov. 1947), Orbost (Nov. 1900); also S.A. (Golden Grove near head of Little Para R.), N.S.W. (Killara, Woodford, Kurri Kurri).

—Mid-lobe *cylindrical and crenate*; perianth pink or reddish, rarely expanding:

782. *T. luteocilium* R. D. FitzG. in *Gdnrs' Chron.* new ser. 17: 495 (1882)—*"T. luteo-ciliata"* Ewart *Flor. Vict.* 330 (1931) et auctt. plur., in err.

Illust.: Nicholls, *Orchids Aust.* 1: t. 20, col. (1951); FitzGerald, *Aust. Orchids* 21: t. col. (1884); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 14 (1934); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 37: t. 8 B (1913).

Vern.: Fringed Sun-orchid. *Distr.*: Scattered through western and south-central Victoria, usually in moist depressions but rare (Ararat, Clydesdale near Yandoit, Ringwood & Bayswater district, Langwarrin); also S.A. (as far west as Eyre Penins.).

12. Perianth *rose-pink*, finely spotted; mid-lobe of column present, prominently dentate:

783. *T. irregularis* W. H. Nicholls in *Vict. Nat.* 63: 126, fig. A-C (1946).

Illust.: Nicholls (*l.c.*); Nicholls, *Orchids Aust.* 1: t. 8, col. (1951).

Vern.: Crested Sun-orchid. *Distr.*: Scattered on heaths and damp open places in near-coastal forests of southern Victoria, but uncommon (Mt. Clay near Portland, Croydon & Montrose, Wonthaggi, Reedy Ck near Cann R. where not infrequent); also N.S.W. (Port Jackson area).

—Perianth *blue*, without spots; mid-lobe of column absent (rare plant of boggy ground in far east):

784. *T. retecta* H. M. R. Rupp in *Vict. Nat.* 60: 176 cum icon. (1944).

Illust.: Rupp (*l.c.*); Nicholls, *Orchids Aust.* 1: t. 14, col. (1951); Nicholls, *Vict. Nat.* 66: 224 fig. P-Q (1950).

Vern.: Sun-orchid. *Distr.*: Very localized and rare in Victoria, where known only from sphagnum bog along the Upper Delegate R. near Bidwell at \pm 3000 ft. alt. (Jan. 1948); also Tas. (Gravelly Beach on Tamar R. near Launceston).

13. Perianth *yellow* or yellowish 20
 Perianth blue, purple, red or pink, but *never* yellow 14
 14. Flowers pink, red or purple; labellum similar to other segments; appendages of column *entire* (but sometimes papillate) 16
 Flowers sky-blue or paler (rarely pink or white), *strongly veined*, the labellum slightly *differentiated*; appendage of column *lacinate* or with a few lobules (plants chiefly alpine or subalpine) 15
 15. Column-appendages *erect and coiled*:

785. *T. venosa* R. Br. *Prodr. Flor. Nov. Holl.* 314 (1810).

Illust.: Nicholls, *Orchids Aust.* 1: t. 49, col. (1955); Smith, *Wild Life* 15: 557 (1952); Forster in Harris, *Wild Flowers Aust.* t. 44, col. (1947); Nicholls, *Vict. Nat.* 59: 202 (1943); Nicholls, *Wild Life* 3: 281 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. p, col. (1934); Green in Pescott, *Vict. Nat.* 50: t. 36 (1934); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 2, col. (1928), also *Vict. Nat.* 43: t. 6 fig. 2, col. (1926); Sulman, *Aust. Wild Flowers* ser. 2: t. 38 (1913); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 58 fig. 1 (1914); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 37: t. 9 B (1913), also *Introd. Study S. Aust. Orchids* ed. 2: 37 (1911); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 102, fig. A, col. (1858); Hatch, *Trans. roy. Soc. N.Z.* 79: t. 77 fig. A-C (1952).

Vern.: Veined Sun-orchid. *Distr.*: In Victoria principally on the eastern highlands where locally frequent in alpine or subalpine bogs (e.g. Lake Mountain, Baw Baws, Mt. Wellington, Mt. Cobbler, Mt. Buffalo, Bogong High Plains, Upper Delegate R.), with isolated occurrences at lower altitude on Maramingo Ck near Genoa, W. Otways; Tas., S.A. (Myponga region), N.S.W., N.Z., N. Cal.

—Column-appendages *horizontal and straight*:

786. *T. cyanea* (Lindl.) Benth. *Flor. aust.* 6: 323 (1873).

Macdonaldia cyanea Lindl. in *Edwards' bot. Reg.* 25: Swan Riv. Appen. I (1840).

Illust.: Nicholls, *Orchids Aust.* 1: t. 50, col. (1955); Nicholls, *Vict. Nat.* 59: 202 (1943); Rodway, *Pap. roy. Soc. Tasm.* 1893: t. 3 opp. 185 fig. 21-22 (1894); Hatch, *Trans. roy. Soc. N.Z.* 79: t. 77 fig. F-H (1952), as "*T. venosa* var. *cyanea*".

Vern.: Rare Veined Sun-orchid. *Distr.*: Very localized and uncommon in Victoria where known only from subalpine heath fringing sphagnum bog at Bidwell on Upper Delegate R. at \pm 3000 ft. alt. (Jan. 1943), also nearer sea-level at Maramingo Ck 6 miles north-east from Genoa (Dec. 1940); Tas. (locally rather common), N.Z., Auckland Is.

[In *Trans. roy. Soc. N.Z.* 79: 391 (1952), E. D. Hatch has reduced *T. cyanea* to a variety of *T. venosa*; the only obvious difference, viz. direction and torsion of column-appendages, certainly seems a very trifling one.]

16. Leaf usually coiled in a spiral; flowers intense purple; column-appendages smooth:

787. *T. matthewsii* Cheeseman in *Trans. N.Z. Inst.* 43: 177 (1910).

T. d'altonii R. S. Rogers in *Trans. roy. Soc. S. Aust.* 54: 42 (1930).

Illust.: Nicholls, *Orchids Aust.* 1: t. 47, col. (1952); Nicholls in Barrett, *Sun Nature Book* n. 5: 13 (1934), as "*T. d'altonii*"; Hatch, *Trans. roy. Soc. N.Z.* 79: t. 77 fig. J-L (1952); Nicholls, *Orchidologia zeylan.* 2: t. opp. 153 fig. C-E (1935), as "*T. d'altonii*".

Vern.: Spiral Sun-orchid. *Distr.*: Scattered in south-western and far eastern Victoria, usually on sandy or gravelly ground in light forest, and rare (northern Grampians, Ararat, Anglesea, Cann R. and Genoa districts); also W.A. (near Armadale and very rare), N.Z. (northern extremity of North Id).

—Leaf *never* coiled; flowers variously coloured; column-appendages papillate or mamillate

17. Perianth pink, up to 2 cm. wide, tardily expanding (except in very hot weather); column-appendages *directed forwards*, no higher than the conspicuous mid-lobe of column 19
 Perianth > 2 cm. wide, opening up freely; column-appendages erect and far exceeding the short mid-lobe 18
18. Flowers salmon-pink to *crimson*; column-appendages *long*, oblong-lanceolate, from slightly *crenulate* to very *rugulose* with gland-like folds:

788. *T. macmillanii* F. Muell. *Fragm. Phyt. Aust.* 5: 93 (1865).

Illust.: Nicholls, *Orchids Aust.* 1: t. 44, col. (1952); Erickson, *Orchids of the West* 19 fig. 18 (1951); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Green in Barrett, *Vict. Nat.* 50: 227 (1934); Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. G, col. (1934); Nicholls, *Vict. Nat.* 49: 223 fig. A, B & D-G (1933); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 35 (1911).

Vern.: Crimson Sun-orchid (Salmon Sun-orchid). *Distr.*: Widespread in western Victoria, usually in open forest associated with auriferous country, but uncommon to rare (Portland, Grampians, Little Desert, Ararat, St. Arnaud, Maryborough, Maldon, Bendigo, Graytown, Rushworth, Brisbane Range, Airey's Inlet, near Mts. Eliza & Martha on Port Philip), with isolated occurrences at Timbertop near Mansfield and Yarram-Hedley district; Tas., S.A., W.A. (Highbury and very rare).

—Flowers bright pink to deep *violet*, usually striated; column-appendages *ovoid*, beset with *finger-like papillæ*:

789. *T. mackibbinii* F. Muell. in *Chem. & Drugg. Lond. Aust. Suppl.* 42: 44 (1881).

Illust.: Nicholls, *Orchids Aust.* 1: t. 37, col. (1952); Nicholls, *Vict. Nat.* 58: 100 (1941), as "*T. chisholmii*".

Vern.: Brilliant Sun-orchid (Babes-in-the-cradle). *Distr.*: Very localized and rare in Victoria where known by only a few collections from gravelly auriferous terrain in the Maryborough and Smythesdale districts; also S.A. (near Port Elliot, Sept. 1896).

19. Perianth 1.5-2 cm. wide; column-appendages externally *papillate-rugose* and *shortly exceeding* the anther, the mid-lobe broad:

790. *T. rubra* R. D. FitzG. in *Gdnrs' Chron.* new ser. 17: 495 (1882).

T. carnea sens. Ewart *Flor. Vict.* 332 (1931), non R. Br. (1810).

Illust.: Nicholls, *Orchids Aust.* 1: t. 41, col. (1952); FitzGerald, *Aust. Orchids* 2¹: t. col. (1884); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 102 fig. B, col. (1858), as "*T. carnea*".

Vern.: Salmon Sun-orchid (Pink Sun-orchid). *Distr.*: Except for the Mallee, grasslands, alps and agricultural country, widespread in Victoria and locally not uncommon, inhabiting both sandy and heavy clay-soils on damp heaths or in light forest (e.g. Lower Glenelg R., Portland district, Wannon Falls near Hamilton, Grampians, Maryborough, Bendigo, Rushworth, Timbertop near Mansfield, Mitta Mitta, Coimadai, Brisbane Range, Otways, Ocean Grove, Arthur's Seat, Ringwood-Bayswater area, Wonthaggi, Wilson Prom., Gillingall near Buchan, Cann R.); Tas., S.A., N.S.W. (central coast between Kiama and Newcastle).

—Perianth <1.5 cm. wide; column-appendages *smooth* or obscurely denticulate, *no higher than* the anther, the mid-lobe narrow:

791. *T. carnea* R. Br. *Prodr. Flor. Nov. Holl.* 314 (1810).

T. elizabethæ F. Muell. in *Vict. Nat.* 7: 116 (1890).

Illust.: Nicholls, *Orchids Aust. 1*: t. 40, col. (1952); FitzGerald, *Aust. Orchids* 1⁶: t. col. (1880); Erickson, *Orchids of the West* 19 fig. 15 (1951); Nicholls in Barrett, *Sun Nature Book* n. 5: 15 fig. A (1934), as "*T. elizabethæ*"; Rupp, *Guide Orchids N.S.W.* 62 (1930); Hatch, *Trans. roy. Soc. N.Z.* 79: t. 76, 78 fig. D-F (1952), as "*T. carnea* var. *imberbis*".

Vern.: Pink Sun-orchid (Tiny Sun-orchid). *Distr.*: Widespread through heaths and open forests of Victoria between the Grampians and Cape Howe, less extensive than *T. rubra* but locally often common (e.g. Creswick, Bendigo, Otways, Bayswater, Launching Place, Kinglake, Graytown, Benalla, Wonthaggi, Leonagatha, Yarram, Store Ck near Bairnsdale, Marlo, Genoa); S.A. (Cherry Gardens in Mt. Lofty Range), N.S.W., N.Z.

20. Leaf *ovate or broadly elliptical*; perianth \pm 1" wide when expanded, heavily *spotted* and blotched with reddish-brown; lateral lobes of column coarsely *lacinate*:

792. *T. fusco-lutea* R. Br. *Prodr. Flor. Nov. Holl.* 315 (1810).

Illust.: Nicholls, *Orchids Aust. 1*: t. 35, col. (1952); Erickson, *Orchids of the West* 19 fig. 13 (1951); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Garnet, *Wild Life* 5: 332 (1943); Dell in Gardner, *W. Aust. Wildflowers* 16, col. (1938); Nicholls in Barrett, *Sun Nature Book* n. 5: 14 (1934), also n. 1: 23 fig. 23 col. (1932); Pescott, *Orchids Vict.* t. inter 48 & 49 (1928), also *Vict. Nat.* 37: t. 4 (1921); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 37: t. 9 A (1913); Reichenbach f., *Xenia Orchidacea* 2: t. 199 (1874).

Vern.: Blotched Sun-orchid (Leopard Orchid—W.A.). *Distr.*: Scattered and occasional in western Victoria, on both gravelly and heavier clay-soils in light forest (Grampians, Goræ & Mt. Clay near Portland, Airey's Inlet, Anglesea, Bellbrae), with isolated and rare occurrences on French Id and Wilson Prom.; S.A. (southern end of Mt. Lofty Range, Kangaroo Id), W.A. (common).

—Leaf *linear*; perianth rarely up to 1" wide, *never* spotted; lateral lobes of column almost entire or absent

21. Scape conspicuously *flexuose*; flowers not > 1 cm. wide, pale creamy-yellow; column-appendages *absent*:

793. *T. flexuosa* Endl. in Endl. & Fenzl. *Nov. Stirp.* 23 (1839).

Illust.: Nicholls, *Orchids Aust. 1*: t. 42, col. (1952); FitzGerald, *Aust. Orchids* 2³: t. col. (1888); Erickson, *Orchids of the West* 19 fig. 22 (1951); Nicholls in Barrett, *Sun Nature Book* n. 5: 15 fig. B (1934); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 101 fig. B, col. (1858), as "*T. smithiana*".

Vern.: Twisted Sun-orchid. *Distr.*: Widespread in heath and sandy scrubland of south-western Victoria where locally common (e.g. Lower Glenelg R., Mt. Clay near Portland, Poolaigelo, Black Range & Grampians, Creswick where very rare, Otways, Torquay), also damp near-coastal heaths of Gippsland (Arthur's Seat, Tonimbuk, Wonthaggi, Wilson Prom., Newmerella, Marlo); Tas., S.A., W.A., ?N.S.W.

—Scape *not* or only slightly flexuose; flowers > 1 cm. wide, usually bright yellow; column-appendages *dark reddish-brown*, long, divergent, cordiform and resembling a pair of ears:

794. *T. antennifera* (Gunn ex Lindl.) Hook. f. *Flor. Tasm.* 2: 4, t. 101 fig. A, col. (1858).

Macdonaldia antennifera Gunn ex Lindl. in *Edwards' bot. Reg.* 25: Swan Riv. Append. I (1840).

Illust.: Archer & Fitch in Hooker f. (*l.c.*); Nicholls, *Orchids Aust.* 1: t. 43, col. (1952); FitzGerald, *Aust. Orchids* 2^d: t. col. (1891); Erickson, *Orchids of the West* 19 fig. 17 (1951); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Garnet, *Wild Life* 5: 332 (1943); Dell in Gardner, *W. Aust. Wildflowers* 17, col. (1938); Nicholls in Barrett, *Sun Nature Book* n. 5: 15 (1934), also n. 1: 22 fig. 9 col. (1932); Ewart, *Flor. Vict.* fig. 153 (1931); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 37: t. 8 A (1913); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 32 (1911); Charsley, *Wild Flowers Melb.* t. 7 fig. 1, col. (1867), as "*Macdonaldia antennifera*".

Vern.: Rabbit-ears (Lemon Orchid—W.A.). *Dist.*: Except for the Mallee, grasslands and agricultural tracts, very widespread through western Victoria and sometimes abundant in heath or light forest (e.g. Lower Glenelg R., Portland district, Poolaigelo, Black Range & Grampians, Little Desert, Ararat, St. Arnaud, Bealiba, Whipstick Scrub near Bendigo, Graytown, Rushworth, Creswick where rare, Brisbane Range, Anglesea, Torquay), formerly along the eastern shores of Port Phillip Bay and with an isolated occurrence on Wilson Prom.; Tas. (north coast and rare), S.A., W.A. (as far north as Geraldton).

262. CALOCHILUS R. Br. (1810)

1. Labellum *glabrous* (with neither hairs *nor* papillæ), ovate-oblong, 1-1.5 cm. long, conspicuously *striped with purple veins*, entire on the concave margins:

795. *C. imberbis* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 51: 4 (1927).

Illust.: Nicholls, *Orchids Aust.* 1: t. 59, col. (1955); Rupp, *Proc. Linn. Soc. N.S.W.* 71: 288 fig. 7 (1947); Nicholls in Barrett, *Sun Nature Book* n. 5: 12 fig. A (1934).

Vern.: Naked Beard-orchid (Beardless Calochilus). *Dist.*: Rare in Victoria where known only by a few collections from isolated localities in the central region, usually inhabiting light sclerophyll forest (the type locality at Rushworth, Timbertop near Mansfield, between Macedon and Gisborne, Ringwood); also Tas. (Woodbridge on D'Entrecasteaux Channel).

[Rogers (*l.c.*) has suggested that *C. imberbis* may represent a peloric development of the hairy-lipped *C. robertsonii* with which it is associated in the field.]

—Labellum *covered* on the lower two-thirds with *purplish papillæ* (but *without hairs*), ovate, entire, 1-1.5 cm. long, the lamina rather sharply contracting into a \pm *tubular*, quite glabrous apex (perianth-segments all conspicuously red-veined):

796. *C. richæ* W. H. Nicholls in *Vict. Nat.* 45: 233, t. 9 (1929).

Illust.: Nicholls (*l.c.*); Nicholls, *Orchids Aust.* 1: t. 60, col. (1955); Rupp, *Proc. Linn. Soc. N.S.W.* 71: 288 fig. 8 (1947); Nicholls in Barrett, *Sun Nature Book* n. 5: 12 fig. B (1934).

Vern.: Bald-tip Beard-orchid (Semi-beard Orchid). *Distr.*: Apparently endemic in Victoria and extremely localized, being known only by the type collection from Whroo near Rushworth (Oct. 1928).

—Labellum 2-3 cm. long, covered with hairs and papillæ, its apex long-ligulate 3

Labellum 1-1.5 cm. long, bearing glabrous, metallic-blue plates on the basal third, the remainder rather shortly but densely and intricately hirsute, very shortly ligulate at apex 2

2. Plant non-rhizomic, with normal lanceolate leaf 4-12" long:

797. *C. campestris* R. Br. *Prodr. Flor. Nov. Holl.* 320 (1810).

C. cupreus R. S. Rogers in *Trans. roy. Soc. S. Aust.* 42: 24, t. 2 (1918).

Illust.: Fiveash in Rogers (*l.c.*); Scott in *Curtis's bot. Mag.* 59: t. 3187, col. (1832); Nicholls, *Orchids Aust.* 1: t. 52, col. (1955); Rupp, *Proc. Linn. Soc. N.S.W.* 71: 288 fig. 1-4 (1947); Black, *Flor. S. Aust.* ed. 2: fig. 295 B (1943); Nicholls, *Vict. Nat.* 58: 94 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 12 (1934), as "*C. cupreus*"; Dickens, *Vict. Orchids* 22 fig. 37 (1929), as "*C. cupreus*"; Rodway, *Some Wild Flowers Tasm.* t. on 104 (1910); Hatch, *Trans. roy. Soc. N.Z.* 77: t. 32 fig. A-C (1949).

Vern.: Copper Beard-orchid (Peaked Beard-orchid, Copper-beards). *Distr.*: In Victoria the most widespread member of the genus, ranging from the Far North-west to extreme south-eastern coast and from sea-level to the sub-alps through a diversity of habitats, scattered but occasionally common (e.g. in such dispersed localities as Hattah, Gypsum, Portland, Moyston, Maldon, Bendigo, Creswick, Otways, Dandenongs, Healesville, Moe, Wonthaggi, Yarram, Orbost, Genoa, Mt. Cobbler, Cravensville near Mt. Benambra, Timber-top near Mansfield); all States except W.A., N.Z. (Kaimaumau near Taupo in North Id).

—Plant with underground rhizomes, leafless but the scape ensheathed by 2-4 bracts (each <4" long):

798. *C. saprophyticus* R. S. Rogers in *Trans. roy Soc. S. Aust.* 54: 41 (1930).

Illust.: Nicholls, *Orchids Aust.* 1: t. 53, col. (1955); Rupp, *Proc. Linn. Soc. N.S.W.* 71: 288 fig. 9 (1947); Nicholls, *Vict. Nat.* 59: 158 (1943); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 106 fig. A, col. (1858), as "*C. campestris*".

Vern.: Leafless Beard-orchid (Pale Beard-orchid). *Distr.*: Very rare in Victoria where known by only a few collections from three widely isolated localities (viz. the type area at Cravensville in Tallangatta Valley, Anglesea, Portland district at Gorae West, Cashmore and Bridgewater); also Tas. (range unknown, owing to former confusion with the closely related but leafy *C. campestris*).

3. Perianth greenish-brown; labellum with fine, metallic-purplish, minutely glandular hairs, the glabrous part of its ligulate and sinuous apex rather short (2-4 mm.); column-wings each with a bead-like gland at base, connected in front by a low purplish ridge:

799. *C. robertsonii* Benth. *Flor. aust.* 6: 315 (1873).

Illust.: Nicholls, *Orchids Aust.* 1: t. 55 & 56, col. (1955); FitzGerald, *Aust. Orchids* 14: t. col. (1878), as "*C. campestris*"; Fiveash in Rupp, *Aust. Encycl.* 6: 412 c

fig. 9, col. (1958), as "*C. campestris*"; Erickson, *Orchids of the West* t. 8 opp. 24, col. (1951); Lee, *Wild Life* 7: 277 (1945); Rupp, *Proc. Linn. Soc. N.S.W.* 71: 288 fig. 5 (1947); Goldsack, *S. Aust. Nat.* 22³: 9 (June 1944); Curtis, *Wild Life* 2: 21 (Nov. 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 12 fig. c (1934); Arnold in Ewart, *Flor. Vict.* frontisp. fig. 7, col. (1931); Rupp, *Guide Orchids N.S.W.* 56 (1930); Dickins, *Vict. Orchids* 22 fig. 36 (1929); Relph in Pescott, *Native Flowers Vict.* t. opp. 87 (1914); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 24 (1911); Meredith, *Bush Friends Tasm.* t. 8, col. (1860), as "*C. campestris*"; Hatch, *Trans. roy. Soc. N.Z.* 77: t. 32 fig. D-F (1949).

Vern.: Purplish Beard-orchid (Brown-beards). *Distr.*: Except for the Mallee, alps, grasslands, heavier forest and cultivated areas, widespread almost throughout Victoria and locally common in many open woodlands (e.g. in such dispersed localities as Lower Glenelg R., Little Desert, Grampians, Whipstick Scrub near Bendigo, Maryborough, Creswick, Macedon, Brisbane Range, Otways, Kinglake Nat. Park, Dandenongs, Beaconsfield, Graytown, Rushworth, Benalla, Mt. Timbertop, Wonnangatta, Tallangatta, Yarram, Wilson Prom., Orbost, Club Terrace, Genoa); all States but very localized in Qd (south-east), S.A. (Mt. Lofty Range) and W.A. (Bayswater, Albany); also N.Z. (between Rotorua & Taupo in North Id).

—Perianth reddish-brown; labellum with fine, *rufous, non-glandular hairs*, the glabrous part of its ligulate and *straight apex conspicuous* (5-10 mm. long); column-wings *without basal glands*, but united in front by a \pm prominent *tooth-like lobe*:

800. *C. paludosus* R. Br. *Prodr. Flor. Nov. Holl.* 320 (1810).

Illustr.: Nicholls, *Orchids Aust.* 1: t. 58, col. (1955); FitzGerald, *Aust. Orchids* 1⁴: t. col. (1878); Rupp, *Proc. Linn. Soc. N.S.W.* 71: 288 fig. 6 (1947); Pescott, *Orchids Vict.* t. inter 32 & 33 (1928), as "*C. campestris*"; Dickins, *Vict. Orchids* 22 fig. 35 (1929), as "*C. campestris*"; Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 58 fig. 2 (1914); Hatch, *Trans. roy. Soc. N.Z.* 77: t. 32 fig. G-J (1949); Bauer in Endlicher, *Icon. Gen. Plant.* t. 14 (1838).

Vern.: Red Beard-orchid (Red-beards). *Distr.*: Scattered through southern Victoria between Portland and Cann R. district, usually on damp or dryish, near-coastal heaths and in light forest, but uncommon (e.g. Croydon-Bayswater and Hurstbridge-Kinglake areas), with outlying occurrences at Mt. Timbertop and Grampians; all States except W.A. but very localized in Qd (south-east coast) and S.A. (Victor Harbour & Cape Jervis region), also N.Z.

[*C. grandiflorus* H. M. R. Rupp, with *filiform* leaf and large golden flowers (to 2" long), has been reported (1957) from Mt. Beauty near Bogong, N.E. Victoria, but confirmatory specimens are awaited; otherwise, this magnificent orchid is known only from Queensland and the far northern coast of New South Wales.]

263. *DIURIS* Sm. (1798)

1. Flowers *purple, lilac or white*; lateral sepals narrow-linear, very much longer than the petals, often 2" long; lateral lobes of labellum much shorter than mid-lobe:

801. *D. punctata* Sm. *Exot. Bot.* 1: 13, t. 8 (1804).

Illustr.: Smith (*l.c.*); FitzGerald, *Aust. Orchids* 1⁴: t. col. (1878) as "*D. elongata*", also 2⁴: t. col. (1891) as "*D. cuneata*"; Fiveash in Rupp, *Aust. Encycl.* 6: 412 c fig. 7, col. (1958); Reeves in Galbraith, *Wildflowers Vict.* t. 25 (1950); Reeves

in Willis, *Walkabout* 17^o: 36 (Sept. 1951), as "*D. alba*"; Reeves in Barrett, *Aust. Wild Flower Book* t. opp. 128, col. (1942); Garnet, *Wild Life* 5: 330 (1943); Nicholls, *Wild Life* 5: 333 (1943), as "*D. alba*"; Nicholls, *Sun Nature Book* n. 5: 27 fig. B, col. (1934), as "*D. alba*"; Nicholls in Barrett, *Sun Nature Book* n. 1: 22 fig. 12, col. (1932), also n. 5: 32 fig. A (1934); Ewart, *Flor. Vict.* fig. 162 (1931), as "*D. alba*"; Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 5, col. (1928), also *Vict. Nat.* 43: t. 6 fig. 5, col. (1926)—both as "*D. alba*"; Rupp, *Guide Orchids N.S.W.* 66 (1930); Dickens, *Vict. Orchids* 16 fig. 28 (1929); Charsley, *Wild Flowers Melb.* t. 7 fig. 2, col. (1867), as "*D. elongata*".

Vern.: Purple Diuris (White Diuris, Long Double-tails). *Distr.*: Scattered through lowland Victoria in natural grassland, savannah or more open woodland and once locally common, but now with much reduced range and becoming rare through destruction of its habitat (e.g. Grampians, Maryborough, Bendigo, Elmore, Lancefield, Riddell near Macedon, Sydenham, Alexandra, Violet Town, Warby Range, Tallangatta, Beaconsfield & Officer, Sale, Bairnsdale, Tambo Valley, Marlo); S.A. (Mt. Gambier and rare), N.S.W., Qd.

[The var. *longissima* Benth. *Flor. aust.* 6: 327 (1873), *D. cuneata* R. D. FitzG. being synonymous, occurs in north-eastern Victoria—Ovens and Upper Murray Rivers—and is distinguished by its pale mauve or white flowers, with extremely long-filamentous lateral sepals (2-3" in length) and a cuneate labellum.

D. alba of Ewart in *Flor. Vict.* 356 (1931) and other Victorian authors, but *not* of R. Brown, is a distinctive, scented form on stony basaltic grassland north-west of Melbourne (where now reduced to great rarity); it has white petals suffused or dotted with lilac, very long sepals and lateral lobes of the fan-shaped labellum comparatively long and broad.]

- Flowers yellow, often with red or purplish-brown spots and blotches 2
- 2. Lateral lobes of labellum much shorter and smaller than mid-lobe 5
Lateral lobes of labellum almost or quite as long and large as the mid-lobe 3
- 3. Leaves numerous, almost filiform; lateral sepals directed forward, much longer than petals; dorsal sepal and petals recurved; all segments heavily blotched with dark purple-brown externally (plant of marshy situations, the smallish flowers often spicily scented):

802. *D. palustris* Lindl. *Gen. & Spec. orchid. Plant.* 507 (1840).

Illust.: FitzGerald, t. col. (? 1894)—separate plate; Goldsack, *S. Aust. Nat.* 22³: 9 (June 1944); Garnet, *Wild Life* 5: 330 (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 32 fig. B (1934).

Vern.: Swamp Diuris. *Distr.*: Excepting the Mallee and northern plains, scattered through western Victoria where sometimes locally frequent in swampy depressions of grassland or open woods (Portland district, Grampians, near Dimboola, Ararat, Talbot-Evansford region, Maryborough, Bendigo, Mt. Alexander, Gisborne, Sydenham, Lara, Mornington where now very rare or extinct); also S.A., Tas.

- Leaves 2 or 3; lateral sepals deflexed, hardly longer or even shorter than petals 4
- 4. Perianth wallflower-coloured (with dark blotches merging insensibly into the yellow ground-colour) or entirely golden; labellum 3-lobed from near the base, the mid-lobe with 1 broad longitudinal ridge on lower portion:

803. *D. longifolia* R. Br. *Prodr. Flor. Nov. Holl.* 316 (1810).

Illustr.: FitzGerald, t. col. (? 1894)—separate plate; Nicholls, *Wild Life* 9: 380 (1947); Goldsack, *S. Aust. Nat.* 22³: 9 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 300 (1943); Reeves, *Wild Life* 1: 20 (Oct. 1938); Gardner, *W. Aust. Wildflowers* 18, col. (1938); Nicholls in Barrett, *Sun Nature Book* n. 5: 33 (1934); Pellée, *Wildflowers W. Aust.* 37 (1921); Dickins, *Vict. Orchids* 16 fig. 31 (1929); Dickins in Pescott, *Native Flowers Vict.* t. opp. 96 fig. 5, col. (1914); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 105 fig. B, col. (1858), as "*D. corymbosa*"; Meredith, *Bush Friends Tasm.* t. 8 col. (1860), as "*D. corymbosa*".

Vern.: Wallflower Orchid (Tall Diuris, Donkey Orchid—W.A.). *Distr.*: Excepting the Mallee, northern plains and farmlands, widely spread and locally not uncommon in western Victoria, on grassland or heath or in light forest (e.g. Lower Glenelg R., Portland, Grampians, Ararat, Skipton, Creswick, Macedon, Brisbane Range, Otways, Torquay, Arthur's Seat, eastern heaths of Port Phillip Bay where now rare), but very scattered and uncommon in the east (Greensborough, Dandenongs, Beaconsfield, Mt. Timbertop near Mansfield, Wilson Prom., Marlo); all States except Qd, but only in far south-east of N.S.W. (at Timbillica).

—Perianth bearing *distinct spots* or blotches (very rarely all pale yellow); labellum 3-lobed from *well above the base*, the mid-lobe with 2 parallel longitudinal ridges along lower part; lateral sepals 12-20 mm. long, curved in opposite directions and *crossing each other* in mature flowers; claws of petals conspicuous, almost *as long as laminae*:

804. *D. maculata* Sm. *Exot. Bot.* 1: 57, t. 30 (1804-05).

Illustr.: Smith (l.c.); *Curtis's bot. Mag.* 59 t. 3156, col. (1832); FitzGerald, *Aust. Orchids* 1²: t. col. (1876); Forster in Harris, *Wild Flowers Aust.* t. 49, col. (1947); Lee, *Wild Life* 7: 277 (1945); Goldsack, *S. Aust. Nat.* 22³: 9 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 32 (1934); Arnold in Ewart, *Flor. Vict.* frontisp. fig. 1, col. (1931); Pescott, *Orchids Vict.* t. inter 64 & 65 (1928), also *Vict. Nat.* 43: t. 19 (1927); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 61 fig. 1 (1914); Sulman, *Aust. Wild Flowers* ser. 2: t. 42 (1913); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 104 fig. B, col. (1858).

Vern.: Leopard Orchid. *Distr.*: Widespread and locally common through Victoria on heath or in open forests, tolerating a diversity of soils, but not in the Mallee, Murray Valley plains, alps, heavy forest or cultivated country (e.g. in such dispersed localities as Black Range & Grampians, Little Desert, Donald, Ararat, St. Arnaud, Bealiba, Whipstick Scrub near Bendigo, Heathcote, Creswick, Lerderderg Gorge, Brisbane Range, Anglesea, Arthur's Seat, Heathmont, Greensborough, Tallarook, Graytown, Rushworth, Cornishtown, Wangaratta, Snowy Ck, Upper Murray R., Suggan Buggan, Bonang, Mt. Kaye, Orbost, Dargo, Wilson Prom., Strzelecki Range); all States except W.A.

—As for the last, but lateral sepals comparatively shorter and broader (10-15 mm. long), *remaining parallel*, and claws of petals much *shorter than laminae*:

805. *D. brevissima* R. D. FitzG. [ut tabula separata (? 1894)].

Illustr.: FitzGerald (l.c.); Nicholls, *Vict. Nat.* 56: 126 (1939).

Vern.: Short-tailed Leopard Orchid. *Distr.*: Scattered through dry sclerophyll forests of western Victoria, chiefly in auriferous country, and uncommon (Pomonal, Grampians, Stawell, Ararat, St. Arnaud, Bendigo, Creswick, Warandye, with an isolated north-eastern occurrence at Mt. Timbertop near Mansfield); also N.S.W. (Woodford in Blue Mtns.—the type locality).

5. Dorsal sepal and petals *without spots or blotches* (clear canary to chrome, rarely orange-yellow), but sometimes with a few brown streaks toward their claws; lateral sepals usually *directed forward*, never deflexed from labellum; petals \pm spreading but not recurved; leaves 5-8 7
Dorsal sepal and/or petals normally *spotted*; lateral sepals always *deflexed*; petals \pm recurved; lateral lobes of labellum almost or $>$ half as long as the mid-lobe 6
6. Flowers with 2 *large* conspicuous dark brown spots or blotches at base of dorsal sepal; petals without spots, 2-3 cm. long; labellum variegated with yellow and brown, 3-lobed from near base, the mid-lobe with a *single* longitudinal ridge throughout and a transverse brown blotch near its apex; leaves 2-3:

806. *D. sulphurea* R. Br. *Prodr. Flor. Nov. Holl.* 316 (1810).

Illust.: Reeves, *Wild Life* 12: 458 (1950); Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. c, *col.* (1934); Coleman, *Vict. Nat.* 50: 6 (1933); Nicholls, *Vict. Nat.* 46: 183 fig. 1-13 (1930); Pescott, *Orchids Vict.* t. inter 64 & 65 (1928), also *Vict. Nat.* 43: t. 19 (1927); Dickins, *Vict. Orchids* 16 fig. 30 (1929); Charsley, *Wild Flowers Melb.* t. 7 fig. 3, *col.* (1867); Meredith, *Bush Friends Tasm.* t. 3, *col.* (1860); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 104 fig. A, *col.* (1858); Rodway, *Orchidologia zeylan.* 2: 35 fig. 3 (1935).

Vern.: Tiger Orchid (Hornets). *Distr.*: Excepting the Mallee, northern plains, alps and cultivated tracts, widespread almost throughout Victoria and co-extensive with *D. maculata* on heaths and in open woodlands, but less frequent in East Gippsland (e.g. in such far separated localities as Glenelg R., Grampians & Black Range, Dimboola, Ararat, Heathmere, Avoca, Bendigo, Creswick, Brisbane Range, Anglesea, St. Leonards, You Yangs, Gisborne, Dandenongs, Tallarook, Graytown, Rushworth, Warby Range, Mt. Timbertop, Tawonga, Quail Id, Wonthaggi, Wilson Prom., Red Jacket Ck, Rosedale, Wonnangatta R., Orbost, Cann R. & Mt. Kaye, Suggan Buggan, Howe Range); all States except W.A., but localized in S.A. (Mt. Gambier, Kangaroo Id).

[*D. brevifolia* R. S. Rogers (1922) is recorded for Victoria by H. M. R. Rupp in *Orchids N.S.W.* 18 (1943), but the basis for the record is unknown—there are no Victorian specimens of the orchid in either of the National Herbaria at Melbourne and Sydney. *D. brevifolia* occurs in South Australia and New South Wales; it is closely related to *D. sulphurea*, differing in the smaller petals, more numerous leaves (4-8), and mid-lobe of the labellum with 2 raised longitudinal lines at base but *without* any transverse blotch near the apex.]

—Flowers with various *small dots* and short linear markings; petals \pm 15 mm. long; labellum 3-lobed from above the base, the mid-lobe broadly shovel-shaped and with 2 *longitudinal ridges* along the narrow base:

807. *D. palachila* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 31: 209 (1907).

Illustr.: Goldsack, *S. Aust. Nat.* 22³: 9 (June 1944); Fiveash in Rogers, *S. Aust. Nat.* 18: t. 3 opp. 61, *col.* (1937); Pescott, *Orchids Vict.* t. opp. 80 (1928); Pescott, *Vict. Nat.* 37: t. 4 fig. 2 (1921); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 29 (1911).

Vern.: Broad-tip Diuris. *Distr.*: Scattered through many parts of Victoria, excepting the Mallee, alps, plains, cultivated tracts and East Gippsland, but rather uncommon (e.g. Grampians, Ararat, St. Arnaud, Creswick, Kyneton & Macedon, Gisborne, Staughton Vale near Brisbane Range, Greensborough, Ringwood, Graytown, Beechworth, Moe); Tas. (Punchbowl near Launceston), S.A., N.S.W.

[It has been suggested, with good reason, that the plant is a natural hybrid between *D. maculata* and *D. pedunculata*, near both of which it always grows. *D. victoriensis* P. Messmer in Rupp (1943), type from Mt. Victoria in the Blue Mountains, was recorded for the Victorian Grampians by its authoress; this taxon is close to *D. palachila* and perhaps derived from the same two parent species.]

7. Leaves 10-15 cm. (4-6") long and >2 mm. wide; flowers *often nodding*; petals and labellum 15-20 mm. long, the latter *horizontal* (or even declined) and with lateral lobes much less than half the length of mid-lobe:

808. *D. pedunculata* R. Br. *Prodr. Flor. Nov. Holl.* 316 (1810).

Illustr.: FitzGerald, *Aust. Orchids I*: t. *col.* (1882); Fiveash in Rupp, *Aust. Encycl.* 6: 412 b-412 c fig. 4, *col.* (1958); Goldsack, *S. Aust. Nat.* 22³: 9 (June 1944); Nicholls in Barrett, *Aust. Wild Flower Book* t. opp. 149 (1942); Nicholls in Barrett, *Sun Nature Book* n. 1: 23 fig. 17, *col.* (1932), also n. 5: 27 fig. H, *col.* 33 (1934); Coleman, *Vict. Nat.* 49: 181 (1932); Nicholls, *Vict. Nat.* 49: 175 (1932); Jarman, *Aust. Plant Drawings* 82 (1930); Rodway, *Some Wild Flowers Tasm.* t. on 102 (1910); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 105 fig. A, *col.* (1858).

Vern.: Golden Moths (Snake Orchid). *Distr.*: Except for the Mallee, heavier forests and farmlands, widespread throughout Victoria and locally abundant, favouring damp depressions on grassland, savannah and more open woods on gently sloping country (e.g. in districts as widely dispersed as Lower Glenelg R., Grampians, Little Desert, Maroona, Hawkesdale, St. Arnaud, Donald, Boort, Heathcote, Creswick, Macedon, Brisbane Range, Torquay, Greater Melbourne, Seymour, Nathalia, Mt. Cobbler, Bogong & Dargo High Plains, Cobboras, Suggan Buggan, Bendoc, Cann R., Orbost, Bairnsdale, Wilson Prom.); all States except W.A.

Leaves <10 cm. long, 1-2 mm. wide; flowers *not nodding*; petals and labellum <15 mm. long, the latter *directed upward* (or almost vertical) and with lateral lobes at least half the length of mid-lobe:

809. *D. fastidiosa* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 51: 6 (1927).

Illustr.: Nicholls in Barrett, *Sun Nature Book* n. 5: 32 (1934); Nicholls, *Vict. Nat.* 49: 23 (1932).

Vern.: Proud Diuris. *Distr.*: Apparently endemic in Victoria on basaltic grassland at Tottenham, and now presumed extinct through obliteration of its habitat (known only by a few collections, including the type, from the same spot during August 1923, '25, '26 & '27).

[*D. fastidiosa* grew in association with *D. pedunculata* and *D. palustris*, both plentiful, and its intermediate characteristics (numerous narrow leaves, length of lateral lobes on labellum etc.) strongly suggest a hybrid origin from these two widespread species.]

264. ORTHOCERAS R. Br. (1810)

810. *O. strictum* R. Br. *Prodr. Flor. Nov. Holl.* 317 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1³: t. col. (1877); Chisholm in Rupp, *Aust. Encycl.* 6: 412 D (1958); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 301 B (1943); Nicholls in Barrett, *Sun Nature Book* n. 1: 23 fig. 18, col. (1932), also n. 5: 34 (1934); Pescott, *Orchids Vict.* t. opp. 64 (1928), also *Vict. Nat.* 43: t. 18 (1927); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 61 fig. 2 (1914); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 37: t. 7 B (1913); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 24 (1911); Hatch, *Trans. roy. Soc. N.Z.* 79: t. 74 (1952).

Vern.: Horned Orchid (Bird's-mouth Orchid—N.S.W.). *Distr.*: Of very discontinuous range in far western, south-central, eastern and north-eastern Victoria, inhabiting wet or dry heaths and tracts of open grassy forest, but uncommon to rare (Grampians, Mt. Arapiles, Little Desert, Ararat & Moy-ston, Anglesea, eastern heaths of Port Phillip Bay where now extinct, Dandenongs, Upper Beaconsfield, Tonimbuk, Western Port, Wilson Prom., Marlo, Upper Murray R., Warby Range); all States except W.A., also N.Z., N. Cal.

Diagn.: Leaves radical, 2-5, narrow-linear, grass-like, to 10" long and to 5 mm. wide, \pm channelled, passing gradually into 2-3 shorter stem bracts; flowers 1-9, almost sessile within large erect floral bracts (2-4 cm. long) along a narrow rigid raceme, the whole inflorescence 8-24" high, green to yellowish-brown; ovary fusiform, conspicuous, 10-20 \times 3-6 mm.; dorsal sepal broadly ovate, acutish, 8-12 \times 7-10 mm., dark-coloured and \pm hooded; lateral sepals narrow-linear to filiform, 15-30 mm. long, erect high above the hood or \pm spreading on each side of it; petals \pm 5 mm. long, oblong, blunt often notched, hidden under dorsal sepal; labellum reddish-brown, 3-lobed, 8-12 mm. long, \pm 7 mm. wide, the mid-lobe elliptic-oblong with entire \pm incurved margins and truncate apex, the lateral lobes \pm erect (4-5 mm. long) and yellow-centred lamina smooth except for a large pyramidal callus at base; column \pm 4 mm. long, with 2 lateral wings that are shorter than the much incurved, bluntly tipped anther; pollinia 2, bilobate, without caudicle.

265. MICROTIS R. Br. (1810)

1. Lateral sepals *recurved* (or even coiled) in mature flowers; labellum with *at least 2 callosities* at base, the margins often crisped 3
Lateral sepals *spreading*, never recurved; labellum entire, smooth, *devoid of callosities* (swamp plants) 2
2. Plant <5" high; spike dense, with minute yellowish flowers that *blacken* in drying; labellum *oblong* to rhomboid, <1 mm. long:

811. *M. atrata* Lindl. in *Edwards' bot. Reg.* 25: Swan Riv. Append. liv (1840).

Illust.: FitzGerald, t. (?) 1894—separate plate; Nicholls, *Vict. Nat.* 66: 93 fig. R (1949); Nicholls, *Wild Life* 9: 381 (1947); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Pescott, *Orchids Vict.* t. opp. 49 (1928), also *Vict. Nat.* 43: t. 12 (1926).

Vern.: Yellow Onion-orchid (Swamp Leek-orchid). *Distr.*: Scattered through southern Victoria, on swampy ground of the wetter and usually near-coastal heaths where often locally abundant, but not in East Gippsland (Portland district, Black Range & Grampians, Moyston, near Geelong where probably now extinct, Ringwood-Warrandyte district, South Belgrave, Healesville, Quail Id in Western Port, Wonthaggi, Wilson Prom.); Tas., S.A., W.A.

—Plant >5" high; spike hardly dense; flowers green, *not blackening*; labellum *orbicular* to broadly elliptic, \pm 1 mm. long:

812. *M. orbicularis* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 31: 63, t. 20 fig. 1 (1907).

Illust.: Rogers (*l.c.*); Nicholls, *Vict. Nat.* 66: 93 fig. Q (1949); Nicholls in Barrett, *Sun Nature Book* n. 1: 23 fig. 6, *col.* (1932), also n. 5: 16 (1934); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 27 (1911).

Vern.: Onion-orchid. *Distr.*: Extremely localized in Victoria where known only from near-coastal heaths in two isolated districts, viz. Wonthaggi (several collections between Nov. 1930 and Oct. 1934) and Gorae West near Portland (Nov. 1936 & Nov. 1942); also S.A. (Victor Harbour, Myponga, Mt. Julian), W.A.

3. Labellum \pm *pointed apically* and, if obtuse (but never truncate), then *without a third callosity*, its margins almost entire 6
Labellum *truncate*, emarginate or bilobed at apex, the margins irregular or crenulate, *a third callosity present* toward the tip 4
4. Spike slender, with rather *distant* fragrant flowers; lateral sepals tightly revolute; labellum narrowly oblong (*as long as ovary* when unrolled), with crenulate margins and a large callosity at apex:

813. *M. oblonga* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 47: 339 (1923).

Illust.: FitzGerald, *Aust. Orchids* 2¹: t. *col.* (1884), as "*M. parviflora*"; Nicholls, *Vict. Nat.* 66: 93 fig. P (1949); Garnet, *Wild Life* 5: 332 (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934).

Vern.: Sweet Onion-orchid (Scented Leek-orchid). *Distr.*: Scattered on damp heaths of southern Victoria between Lower Glenelg R. and Howe Range and locally not infrequent (e.g. Portland district, Hawkesdale, Ararat, Ringwood, South Belgrave, Healesville, Wilson Prom., Marlo, Combiobar, Club Terrace, Mallacoota), appearing also on alpine grassland at Mts. Buller, Stirling & Wellington; all States except W.A., but in Qd restricted to the far South-east (Wallangarra district).

—Spike compact, with *closely placed* flowers; lateral sepals often only gently recurved; labellum shortly oblong (*much shorter than ovary*) 5

5. Labellum *broadly emarginate*, with crisped margins; a large callosity occupying upper half of the lamina (inflorescence usually >6 cm. long):

814. *M. unifolia* (Forst. f.) Reichenb. f. *Beitr. syst. Pflk.* 62 (1871).

Ophrys unifolia Forst. f. *Flor. Ins. Aust. Prodr.* 59 (1786);

M. porrifolia (Swartz, ut *Epipactis* sp.) R. Br. ex Spreng. *Syst.* 3: 713 (1826).

Illust.: FitzGerald, *Aust. Orchids* 2¹: t. *col.* (1884), as "*M. porrifolia*"; Lee *Wild Life* 13: 353 (1951); Nicholls, *Vict. Nat.* 66: 93 fig. M (1949); Fiveash in Black,

Flor. S. Aust. ed. 2: fig. 296 ii (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Goldsack, *S. Aust. Nat.* 22³: 9 (June 1944), as "*M. porrifolia*"; Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 118 fig. A & B, *col.* (1858), as "*M. pulchella*" & "*M. arenaria*" resp.; Hatch, *Trans. roy. Soc. N.Z.* 79: t. 73 fig. 2 (1952); Smith, *Orchideen Java Atlas I*: fig. 26 (1908).

Vern.: Common Onion-orchid (Common Leek-orchid, Common Mignonette-orchid—W.A.). *Distr.*: Excepting the Mallee, alps, heavily forested land and agricultural tracts, widespread and abundant almost throughout Victoria (e.g. in such dispersed localities as Lower Glenelg R., Portland, Grampians, Little Desert, Hawkesdale, St. Arnaud, Whipstick Scrub near Bendigo, Heathcote, Creswick, Brisbane Range, Otways, Greater Melbourne, Dandenongs, Kinglake Nat. Park, Tallarook, Rushworth, Nathalia, Warby Range, Mt. Timber-top, Cravensville, Upper Murray R., Cobungra, Howe Range, Cann R., Combienbar, Marlo, Wilson Prom, Enoch's Point, Quail Id, Tonimbuk); all States, N.Z., N. Cal., Java, China & Japan.

—Labellum prominently and *divergently bilobed* at apex (with minute recurved mucro on under-side of sinus), the margins irregular; a minute callosity present near tip (inflorescence short, <6 cm.):

815. *M. biloba* W. H. Nicholls in *Vict. Nat.* 66: 94, 93 fig. J-L (1949).

Illust.: Nicholls (*l.c.*).

Vern.: Onion-orchid. *Distr.*: Known in Victoria only by the type from Moe (Dec. 1946) and a second collection from the Tyers R. at Gould (Nov. 1957) where locally rather common on damp inundated flats, but perhaps of much wider occurrence and overlooked; apparently also N.S.W. (at Narrabeen).

6. Lateral sepals tightly revolute; labellum *cordate*, \pm 3 mm. long, with minute callosity at tip:

816. *M. holmesii* W. H. Nicholls in *Vict. Nat.* 66: 94, 93 fig. G-I (1949).

Illust.: Nicholls (*l.c.*).

Vern.: Onion-orchid. *Distr.*: Apparently endemic in Victoria and very localized, being known only by the type collection from Moe in West Gippsland (Dec. 1946).

—Lateral sepals recurved; labellum *tongue-shaped*, <2 mm. long (inflorescence contracted upward and spire-like) 7

7. Labellum blunt at tip, with 2 *small callosities* at very base but none toward apex:

817. *M. parviflora* R. Br. *Prodr. Flor. Nov. Holl.* 321 (1810).

Illust.: Bauer in *Curtis's bot. Mag.* 62: t. 3377, *col.* (1835); Nicholls, *Vict. Nat.* 66: 93 fig. N-O (1949); Garnet, *Wild Life* 5: 332 (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Ito, *Ill. formosan Plant.* t. 224 (1927); Bauer in Endlicher, *Icon. Gen. Plant.* t. 15 (1838).

Vern.: Slender Onion-orchid (Slender Leek-orchid, Small-tongue Onion-orchid). *Distr.*: Scattered on heath, in damp grassy places and open forests throughout southern and north-eastern Victoria where locally frequent (e.g. Lower Glenelg R., Portland district, Grampians, Ararat, Glenfyne near Cobden, Ballarat, Whipstick Scrub near Bendigo, Brisbane Range, Greater Melbourne, Belgrave, Arthur's Seat, Beaconsfield, Marysville, Barry Mtns., Harriettville, Warby Range,

Wodonga, Upper Murray R., Wonthaggi, Marlo, Orbost), but not in the alps proper; all States, but localized in W.A. (Albany), also N.Z., ?N. Cal., and various islands as far north as China.

—Labellum apiculate, with 2 large *cushion-like swellings* (taking up the basal third) and a slight granular excrescence near apex:

818. *M. bipulvinaris* W. H. Nicholls in *Vict. Nat.* 66: 92, 93 fig. A-F (1949).

Illust.: Nicholls (*l.c.*).

Vern.: Onion-orchid. *Distr.*: Known in Victoria only from Quail Id in Western Port Bay (the type locality, Sept. 1943 & Nov. 1952) and Creswick (Jan. 1953), both in damp grassy places, but doubtless more widespread; also N.S.W. (Woodford in Blue Mtns. & Pennant Hills near Sydney).

[*M. bipulvinaris* may ultimately prove to be a variant of the closely related *M. parviflora*, showing an extraordinary development of the two callosities at base of labellum.]

266. PRASOPHYLLUM R. Br. (1810)

1. Leaf *fully developed* at flowering time (spring to summer); scape normally > 2 mm. thick; spike *far longer than 3 cm.*; labellum *sessile* or shortly clawed, but *not movable* [Section EUPRASOPHYLLUM] 6
 Leaf *undeveloped* at flowering time (summer to late autumn); scape very slender (1-2 mm. thick); spike *congested, very short* (to 3 cm. long); perianth < 6 mm. long, the segments sometimes gland-tipped, often *sharply deflexed* and very dark-coloured; labellum *articulate at base* and *freely movable* [Section MICRANTHUM] 2
2. Various floral segments *fringed with cilia* 5
 Floral segments quite *devoid of cilia*, except (rarely) on labellum-tip 3
3. Lateral sepals and labellum all lanceolate and *long-acuminate*:

819. *P. despectans* Hook f. *Flor. Tasm.* 2: 13, t. 113 fig. A, col. (1858).

P. brachystachyum sens. Ewart *Flor. Vict.* 320 (1931), *non* Lindl. (1840).

Illust.: Archer & Fitch in Hooker f. (*l.c.*); Garnet, *Vict. Nat.* 56: t. 17 fig. A-C (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 18 (1934); Ewart, White & Rees, *Proc. roy. Soc. Vict.* new ser. 23: t. 24 (1910), fig. 1-6 as "*P. brachystachyum*"; Pescott, *Orchids Vict.* t. opp. 49 (1928), also *Vict. Nat.* 43: t. 12 (1926)—both as "*P. nigricans*".

Vern.: Sharp Midge-orchid (Tiny & Purple Leek-orchid). *Distr.*: Widespread through western Victoria, excepting the Mallee, and sometimes frequent on stony hillsides in drier sclerophyll forest (e.g. Portland district, Grampians, Ararat, Newstead, Creswick, Gisborne district, Brisbane Range, Otways, Whittlesea-Eltham region, Ringwood & Warrandyte, Mornington Penins. at Langwarrin & Arthur's Seat), with isolated subalpine occurrences on Mts. Wellington & Cobbler; also Tas. (widespread).

[*P. despectans* var. *intermedia* Ewart & Rees in *Proc. roy. Soc. Vict.* new ser. 23: 113 (1910), presumed to differ from the typical form in the configuration of its column-appendages, is superfluous; the illustrations depart in no essential feature from the normal variability found within populations of *P. despectans*—Ewart himself later dropped this variety from *Flor. Vict.* 319-320 (1931).]

—Labellum *never* tapering into a long acumen

4. Lamina of labellum \pm *diamond-shaped* (broadening upwards for two-thirds of the length, then suddenly contracting into an acute, recurved point), *irregularly serrulate* on the wide margins; callus *extending almost into the apex*:

820. *P. nigricans* R. Br. *Prodr. Flor. Nov. Holl.* 319 (1810).

P. dixonii F. Muell. in *Vict. Nat.* 9: 44 (1892).

Illust.: FitzGerald, *Aust. Orchids* 1⁵: t. col. (1879); Garnet, *Vict. Nat.* 56: t. 17 fig. D-F, t. 18 fig. o (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 18 (1934); Rupp, *Guide Orchids N.S.W.* 83 (1930); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 33: t. 7 A (1909), also *Introd. Study S. Aust. Orchids* ed. 2: 10 (1911).

Vern.: Midge-orchid (Dark Leek-orchid). *Distr.*: Excepting the northern Mallee, plains and agricultural tracts, very widespread in western and north-eastern Victoria where often frequent on stony auriferous terrain under dry, light sclerophyll forest (e.g. Portland district, Grampians, Little Desert, Talbot, Maryborough, Castlemaine-Newstead district, Whipstick Scrub near Bendigo, Coimadai, Brisbane Range, You Yangs, Ocean Grove, Tallarook, Graytown, Rushworth, Cravensville in Tallangatta Ck valley), but apparently not near Melbourne and with only isolated occurrences in East Gippsland (McKenzie & Genoa Rivers); all States except W.A., but localized in Qd (Far South-east).

[*P. rufum* R. Br. *Prodr. Flor. Nov. Holl.* 319 (1810) of New South Wales is extremely close to *P. nigricans*, the only significant difference seeming to be in their bifid column-wings—the 2 lobes of each wing almost *equal, sharp* and darkly coloured in *P. nigricans*, but the upper lobe typically shorter, paler (almost white) and *very blunt* in *P. rufum*. Lateral sepals in *P. rufum* are often tipped with bead-like glands, but by no means always, and probably one were better regarded as a geographical variant of the other than as a distinct species.

P. dixonii F. Muell. (*l.c.*) is morphologically identical with *P. nigricans*, having been described from pale, yellowish inflorescences growing in a shaded swamp at South Oakleigh, Victoria, thereby not even meriting varietal distinction.]

—Lamina of labellum *broadly elliptical*, long-clawed, obtuse, its wide margins *almost entire*, dark reddish-brown in contrast to the other bright green segments; callus *failing below the apex* (desert plant of Mallee sands):

821. *P. fusco-viride* F. M. Reader in *Vict. Nat.* 14: 163 (1898).

Illust.: Nicholls in Barrett, *Sun Nature Book* n. 5: 18 (1934); Ewart, White & Rees, *Proc. roy. Soc. Vict.* new ser. 22: t. 10 fig. 5-8 (1909).

Vern.: Mallee Midge-orchid (Dusky Leek-orchid). *Distr.*: Confined in Victoria to the far west, but locally common on Mallee sand-hills (from Kulkyn Nat. Forest through the Big & Little Deserts to Dimboola), with an isolated coastal occurrence at Bridgewater near Portland; also S.A., W.A. (where abundant in some inland districts). This is probably the most drought-tolerant species in the genus.

—Lamina of labellum *oblong*, often obscurely and *minutely ciliate* at apex, neither auriculate at base *nor papillose*; callus very broad, *occupying almost the whole surface*; flowers dark, *exceedingly congested* (rare subalpine plant to 4" tall):

822. *P. densum* R. D. FitzG. in *J. Bot., Lond.* 23: 135 (1885).

Illust.: FitzGerald, *Aust. Orchids* 2⁴: t. col. (1891); Nicholls, *Vict. Nat.* 57: 211 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 19 (1934).

Vern.: Dense Midge-orchid. *Distr.*: Extremely localized and rare in Victoria, where known by a single collection from the Upper Moroka R. on Mt. Wellington plateau at 3-4000 ft. alt. (Dec. 1937); also N.S.W. and Qd (at Noosa Heads).

—As for the last, but the deeply concave labellum *papillose*, with a prominent *basal auricle on each side*, and the *yellowish-green* flowers close but *not congested* (rare plant of far east, on coastal grass-tree plains):

823. *P. viride* R. D. FitzG. in *J. Bot., Lond.* 23: 135 (1885).

Illust.: FitzGerald, *Aust. Orchids* 2⁴: t. col. (1891); Nicholls in Barrett, *Sun Nature Book* n. 5: 19 (1934).

Vern.: Green Midge-orchid. *Distr.*: Apparently very localized in Victoria where known by only two collections (Apr. & May 1960) from Mallacoota in far East Gippsland, on coastal heath dominated by *Xanthorrhoea hastilis* ("grass-tree plains"); also N.S.W., Qd (at Burleigh Heads in extreme south-east, and rare).

5. Cilia *very long*, fringing the *dorsal sepal*, petals and irritable labellum; perianth 4-6 mm. long, blackish-purple:

824. *P. morrisii* W. H. Nicholls in *Vict. Nat.* 48: 108, 111 fig. d-g, i, j, n, o, r, s (1931).

P. fimbriatum sens. Ewart *Flor. Vict.* 321 (1931), *non* R. Br. (1810).

Illust.: Nicholls (*l.c.*); Scammell in Rupp, *Orchids N.S.W.* t. 5 opp. 38 (1943); Garnet, *Vict. Nat.* 56: t. 17 fig. G, H & J (1940); Nicholls in Barrett, *Sun Nature Book*, n. 5: 18 (1934).

Vern.: Bearded Midge-orchid (Fringed & Hairy Leek-orchid). *Distr.*: Not uncommon on sandy or stony terrain in light forests of south-western and south-central Victoria (e.g. Poolaigelo & Casterton on Glenelg R., Grampians, Ararat, Creswick, Gisborne, Lancefield district, Brisbane Range, Otways, eastern bay-side suburbs of Melbourne where now very rare, Dromana, Dandenongs, Moe, Foster), with isolated records for the north-east and far east (viz. Mt. Cobbler, Cravensville on Tallangatta Ck, Upper Genoa R.); also Tas., N.S.W. (as far north as Blue Mtns.).

—Cilia *short*, on labellum and column appendages (rarely present also on petals); perianth rather acutely segmented, 4-5 mm. long, green to purplish, often deflexed:

825. *P. archeri* Hook f. *Flor. Tasm.* 2: 14, t. 113 fig. B, col. (1858).

P. intricatum C. Stuart ex Benth. *Flor. aust.* 6: 346 (1873);

P. ciliatum Ewart & B. Rees in *Proc. roy. Soc. Vict.* new ser. 25: 111, t. 6 fig. d-g (1912).

Illust.: Archer & Fitch in Hooker f. (*l.c.*); Ewart & Rees (*l.c.*); Garnet, *Vict. Nat.* 56: t. 17 fig. K-M, t. 18 fig. N (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 18 (1934); Nicholls, *Vict. Nat.* 48: 111 fig. h, k, m, p, q, t (1931); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 38: t. 14 (1914), as "*P. intricatum*".

Vern.: Variable Midge-orchid (Archer's, Elfin & Hairy Leek-orchid). *Distr.*: Scattered through more open forests of south-western, central and eastern Victoria, from sea-level to the sub-alps, but rather uncommon (e.g. Grampians, Stawell, Ararat, Maryborough, Newstead, Gisborne, Mt. Macedon, Otways, Bayswater, Dandenongs, Wonthaggi, Foster, Moroka Valley near Mt. Wellington, Mts. Cobbler & Buffalo, Cobungra, Nunniong Plateau, Wulgulmerang); all States except W.A., but very localized in S.A. (Mount Compass) and Qd (Kirra, Archerfield).

—Cilia *minute*, on the papillose labellum and on column appendages; perianth <3 mm. long, green to purplish; ovary strongly arched:

826. *P. beaugholei* W. H. Nicholls in *Vict. Nat* 59: 11, 12 fig. M-U (1942).

Illust.: Nicholls (*l.c.*); FitzGerald, *Aust. Orchids* 2⁴: t. col. (1891), as "*P. intricatum*"; Rupp, *Vict. Nat.* 59: 128 fig. J (1942); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 113 fig. c, col. (1858), as "*P. nudum*".

Vern.: Midge-orchid. *Distr.*: Apparently very localized in Victoria where known by only four collections from the far south-west and far east, usually inhabiting grassy places in open forest or poor stony hillsides, viz. Gorae West near Portland (Feb. 1942), Bidwell on Upper Delegate R. at 3000 ft. alt. (Jan. 1943 & Jan. 1948), Mt. Stradbroke near Wulgulmerang at 4000 ft. alt. (Feb. 1945); also Tas., N.S.W. (Mts. Irvine & Wilson in Blue Mtns.).

- | | |
|---|----|
| 6. Sepals <i>free or nearly so</i> (sometimes connate in the basal third) | 11 |
| Sepals \pm <i>connate throughout</i> (only the tips occasionally free) | 7 |
| 7. Labellum <i>gently recurved</i> , never sharply reflexed | 9 |
| Labellum <i>acutely reflexed at centre</i> , white with conspicuously crisped and undulate margins (\pm slender plants) | 8 |
| 8. Petals (also lateral sepals) <i>blunt, white</i> , suffused with pink or purplish tints and often with red stripe along centre, the margins \pm undulate; labellum <i>not</i> gibbous, recurved to form an angle of $\pm 60^\circ$; callus ending <i>slightly beyond bend</i> (alpine plant, flowering Dec.-March): | |

827. *P. suttonii* R. S. Rogers & B. Rees in *Proc. roy. Soc. Vict.* new ser. 25: 112, t. 6 fig. a-c (1912).

Illust.: Rogers & Rees (*l.c.*); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Nicholls, *Vict. Nat.* 50: 70 (1933).

Vern.: Mauve Leek-orchid (Sutton's & Alpine Leek-orchid). *Distr.*: Confined in Victoria to the eastern highlands where widespread in herbfield, grassland and bog formations of the alps or sub-alps from 3-6000 ft., and locally not uncommon (Lake, Mtn., Baw Baws, Mt. Skene, Mt. Wellington, Mts. Buller & Stirling, Mt. Buffalo, Bogong & Dargo High Plains, Mt. Hotham, Cobungra, Mt. Gibbo, Cobboras, Bidwell on Upper Delegate R.); Tas., N.S.W., A.C.T., N.Z. (occasional in North Id at 2-4000 ft. alt.).

—Petals (and sepals) *acuminate, not* (or very rarely) white or pinkish, the margins *not* undulate; labellum *not* gibbous, very acutely bent back so that the apical half *lies along and almost touches* the under-surface of basal portion; callus *extending beyond bend* (typically montane, often slender plant):

828. *P. brevilabre* (Lindl.) Hook f. *Flor. Tasm.* 2: 11, t. 110 fig. A, col. (1858).
P. lutescens Lindl. var. *brevilabre* Lindl. *Gen. & Spec. orchid. Plant.*
 514 (1840).

Illust.: Archer & Fitch in Hooker f. (l.c.); FitzGerald, *Aust. Orchids* 2¹: t. col. (1884); Nicholls in Barrett, *Sun Nature Book* n. 5: 17 (1934); Rupp, *Guide Orchids N.S.W.* 79 (1930):

Vern.: Short-lip Leek-orchid. *Distr.*: Widespread through cooler parts of Victoria from the Grampians to Howe Range, commonly in montane or subalpine forests but also on near-coastal heaths, and usually of scattered occurrence (e.g. Glenfyne near Cobden, Otways, Brisbane Range, Kinglake Nat. Park, Bayswater, Dandenongs, Warburton, Baw Baws, Moroka R. near Mt. Wellington, Mt. Timbertop, Mt. Cobbler, Barry Mtns., Mt. Buffalo, Tallangatta Ck valley, Wonthaggi, Wilson Prom., Yarram, and rather common on coastal tracks and hills of East Gippsland); Tas., N.S.W., Qd (south-east).

—As for the last, but labellum prominently *gibbous at base*, Sharply recurved to form an angle of $\pm 45^\circ$, and callus terminating abruptly in 2 distinct swellings *at or below the bend* (lowland plant, usually of swampy heaths, the fragrant and often congested flowers with erect, rather narrow ovaries):

829. *P. australe* R. Br. *Prodr. Flor. Nov. Holl.* 318 (1810).

Illust.: Erickson, *Orchids of the West* 54 fig. 1 (1951); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 38 (1911); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 33: t. 8 fig. 1-7 (1909); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 110 fig. B, col. (1858), as "*P. lutescens*".

Vern.: Austral Leek-orchid. *Distr.*: An occasional component of wet, usually near-coastal heaths of southern Victoria, from the Lower Glenelg R. to Mallacoota, sometimes extending into open forest (e.g. Portland district, Glenfyne near Cobden, Otways, Bayswater, Dandenongs, Wonthaggi, Wilson Prom., Yarram, Maffra, Orbost, Marlo, Thurra R.); all States, but in Qd confined to a few far southern localities and rare.

9. Plants <1 ft. high, slender to moderately stout; leaf usually exceeding inflorescence; labellum margins narrow, *never crenulate*; callus thick and extending almost *to labellum tip*; fused lateral sepals *narrow*, sometimes free for upper half (alpine plant, flowering Dec.-Feb.):

830. *P. alpinum* R. Br. *Prodr. Flor. Nov. Holl.* 318 (1810).

P. tadgellianum R. S. Rogers in *Trans. roy. Soc. S. Aust.* 47: 338 (1923).

Illust.: FitzGerald, *Aust. Orchids* 2¹: t. col. (1884); Nicholls, *Proc. roy. Soc. Vict.* new ser. 46: 35 fig. A-G (1933); Nicholls in Barrett, *Sun Nature Book* n. 5: 17 (1934); Green, *Vict. Nat.* 40: t. 18 (1924), as "*P. tadgellianum*"; Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 112 fig. A, col. (1858).

Vern.: Alpine Leek-orchid (Bogong Leek-orchid). *Distr.*: Restricted in Victoria to alpine grassland and herbfield above 4500 ft. alt., but locally abundant (Baw Baws, Bennison Plains & Mt. Howitt, Mt. Buffalo, Bogong & Dargo High Plains, Nunniong Plateau where very frequent, Cobboras); also Tas., N.S.W. (Kosciusko region).

- Plants 1-5 ft. high, stout and robust; leaf much shorter than inflorescence; labellum margins *moderately crenulate*; callus terminating at or slightly beyond the bend; fused lateral sepals *very broad* and hood-like 10
10. Stem and leaf always very dark, the latter with *short erect blade* <4 cm. long; flowers dull *yellowish brown*, the segments <1 cm. long; labellum \pm *gibbous* at base (plant typically montane, flowering Nov.-Jan.):

831. *P. flavum* R. Br. *Prodr. Flor. Nov. Holl.* 318 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1³: t. col. (1877), also 2¹: t. col. (1884) as "*P. australe*"; Nicholls, *Vict. Nat.* 48: 191 (1932); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 109 fig. A, col. (1858).

Vern.: Yellow Leek-orchid. *Distr.*: Scattered in coastal to montane forests of southern and eastern Victoria, but usually rare or occasional (Portland district, Grampians, Dandenongs, Baw Baws, Wonthaggi, Foster, Moroka R. near Mt. Wellington, Bogong township, Bidwell on Upper Delegate R., Bendoc, Mallacoota); Tas., N.S.W., Qd (only Stanthorpe district in extreme south).

- Stem pale green to dark brown; leaf-blade *conspicuous*, >4 cm. long; flowers *greenish to claret* or slaty-brown, the segments 1 cm. long or more; labellum *not gibbous* (plant of lowland heathy tracts, usually 20-50" high, flowering Aug.-Nov.):

832. *P. elatum* R. Br. *Prodr. Flor. Nov. Holl.* 318 (1810).

Illust.: FitzGerald, *Aust. Orchids* 2¹: t. col. (1884); Chisholm in Rupp, *Aust. Encycl.* 6: 412 D (1958); Nicholls, *Wild Life* 9: 382 (1947); Garnet, *Wild Life* 7: 81 (1945), also 5: 332 (1943); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Rupp, *Guide Orchids N.S.W.* 78 (1930); Dickins, *Vict. Orchids* 8 fig. 14 & 16 (1929), fig. 16 as "*P. dixonii*"; Pescott, *Vict. Nat.* 43: t. 10 (1926); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 60 fig. 1 (1914); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 33: t. 8 fig. 8-15 (1909).

Vern.: Tall Leek-orchid. *Distr.*: A locally frequent component of near-coastal and usually wet heaths of southern Victoria, from the Lower Glenelg R. to Genoa R. (e.g. Portland district, Glenfyne near Cobden, Otways, Point Lonsdale, Arthur's Seat, eastern bay-side of Port Phillip & Dandenongs where now rare, Wonthaggi, Wilson Prom.), with isolated western occurrences in the Grampians and at Wyperfeld Nat. Park; all States, but very localized in Qd (Maroochy district and south coast).

11. Labellum curved but *not* acutely reflexed at centre, or, if so, then without conspicuous white and crisped margins; callus usually extending *well beyond* the bend 13
Labellum (and usually the petals) conspicuously white or pinkish, with wide very crispate margins, *acutely reflexed at centre*; callus usually extending *only slightly beyond* the bend (flowers often fragrant) 12
12. Petals with *rosy-purplish* markings; labellum *ovate, broad*, shortly clawed, its tip *not protruding* between the entire bluntish lateral sepals (alpine plant, flowering Dec.-March):

P. suttonii R. S. Rogers & B. Rees [See No. 827].

—Petals *not* normally marked with mauve or purple; labellum *oblong-lanceolate*, sessile, its tip *protruding* from between the acute and sometimes bidentate lateral sepals (lowland or hill plant):

833. *P. odoratum* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 33: 209, t. 9 B (1909).

Illust.: Fiveash in Rogers (*l.c.*), also t. 10 A (1909) as "*P. album*"; Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 296 iii (1943); Goldsack, *S. Aust. Nat.* 22³: 11 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Coleman, *Vict. Nat.* 49: 215 (1933), also 216 (1933) as "*var. album*"; Pescott, *Orchids Vict.* t. inter 48 & 49 (1928), also *Vict. Nat.* 41: t. 8 fig. 4 (1925), as "*var. album*".

Vern.: Sweet Leek-orchid. *Distr.*: Widespread throughout western, south-central and eastern Victoria, between Lower Glenelg R. and Mallacoota, inhabiting near-coastal heaths where often frequent, open grassy woodlands and montane to subalpine forest where of more scattered, disjunct occurrence (e.g. Portland district, Black Range & Grampians, Stawell, Dimboola, Little Desert, Kewell, Donald, St. Arnaud, Bendigo, Creswick & Ballarat, Glenfyne near Cobden, Otways, Bannockburn, Lara, Mornington, Bayswater & Dandenongs, Healesville & Warburton, Kinglake, Tonimbuk, Grantville & Lang Lang, Wonthaggi, Leongatha, Wilson Prom., Yarram, Sale, Cape Conran), but uncommon to rare in north-east (Mts. Cobbler & Buffalo, Cravensville); all States except W.A., but only in extreme south of Qd (Wallangarra region).

[The *var. album* (R. S. Rogers, ut sp.) R. S. Rogers in Black *Flor. S. Aust.* 126 (1922) has smaller, paler, odourless flowers with lateral sepals not exceeding 8 mm. in length. It was originally published as a species in *Trans. roy. Soc. S. Aust.* 33: 211 (1909), and has since been found in Victoria at Anglesea, Point Lonsdale and Leongatha.]

—As for the last, but the distal *resupinate* third of labellum ending *far short* of lateral sepals (never protruding) and the callus plate often extending far beyond bend:

P. brevilabre (Lindl.) Hook. f. [See No. 828].

13. Flowers 50-80, *very congested* on spike, with *reddish-purple markings*; labellum dark purplish, very broad, reniform-cordate; callus reaching almost to labellum-tip (fragrant subalpine plant <1 ft. high):

834. *P. morganii* W. H. Nicholls in *Vict. Nat.* 46: 179, t. 7 (1930).

Illust.: Nicholls (*l.c.*); Nicholls in Barrett, *Sun Nature Book* n. 5: 18 (1934).

Vern.: Mignonette Leek-orchid (Dense Leek-orchid). *Distr.*: Apparently endemic and extremely localized in Victoria, where known only from Cobungra between Omeo and Mt. Hotham, on sunlit stony slope in open forest (three collections —Nov. 1929, Oct. 1931, Nov. 1933—each of very few flower-spikes).

—Flowers <50, *rather loose* on spike, *not* wholly pale greenish or, if so (rarely), then labellum on a claw and with entire or crenate (but *non-ciliate*) margins. 15

—Flowers <50, *quite loose*, *wholly pale green* or yellowish; labellum sessile, ovate-lanceolate, shortly *papillate-ciliate* on the whitish margins 14

14. Labellum with *gentle sigmoid flexure*, *no* basal appendage and callus extending to *slightly beyond the bend* (flowers very fragrant):

835. *P. brainei* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 46: 149 (1922).

Illust.: Garnet, *Wild Life* 7: 81 (1945), also 5: 332 (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 17 (1934); Pescott, *Orchids Vict.* t. inter 48 & 49 (1928), also *Vict. Nat.* 41: t. 8 fig. 4 (1925).

Vern.: Green Leek-orchid. *Distr.*: Scattered on damp, sandy ground in far western, southern and eastern Victoria, often among grasses and rushes, but uncommon (Cavendish, Pomonal, Grampians, near Kaniva, Bannockburn, Mt. Eliza & Arthur's Seat on Mornington Penins., Ringwood & Bayswater, Woori-Yallock, Emerald, Wonthaggi, Hedley & Yarram, Marlo), with isolated subalpine occurrences on Mts. Wellington & Howitt; also Tas. (St. Helens, Don R. where locally plentiful).

—Labellum *abruptly bent*, with prominent *subulate appendage* at base and callus extending *almost to apex* (flowers with little or no perfume):

836. *P. pallidum* W. H. Nicholls in *Proc. roy. Soc. Vict.* new ser. 46: 33, 35 fig. P-U (1933).

Illust.: Nicholls (*l.c.*); Nicholls in Barrett, *Sun Nature Book* n. 5: 17 (1934); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 33: t. 13 A (1909), as "*P. fuscum*".

Vern.: Pale Leek-orchid. *Distr.*: Very localized and rare in Victoria where known by only two collections (Oct. & Nov. 1932) from sandy ground in open forest at Devil's Garden near Pomonal (eastern Grampians); also S.A. where rather widely distributed.

15. Petals *lavender or lilac*, oblongate, *bluntish*, 6-8 mm. long; labellum *concolorous*, widely ovate, very slightly flexed at centre, crenate; callus terminating just beyond the bend:

837. *P. colemanæ* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 47: 337 (1923).

Illust.: Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Green, *Vict. Nat.* 43: t. 3 opp. 114 (1926).

Vern.: Lilac Leek-orchid. *Distr.*: Apparently endemic in Victoria, extremely localized and rare, being known only by the type collection from Bayswater (Nov. 1922). It is probable that the original colony of plants has long since disappeared through encroaching settlement; and no support has been found for the statement by Ewart, in *Flor. Vict.* 315 (1931), "also in South Australia".

—Petals and labellum neither all lavender-coloured *nor* combining the above features (usually *green or brownish* or streaked with red) 16

16. All floral segments > 4 mm. long 18

All segments 4 mm. long or less; flowers widely spaced along spike; labellum almost sessile, recurved through no more than 90°, with channelled callus extending almost to apex 17

17. Labellum *ovate-lanceolate*, the margins minutely *crenulate-fimbriate*; callus only slightly raised, but its *undulate purplish edges* very conspicuous and the central portion a deep green channel; lateral sepals *quite free*:

838. *P. subbisectum* W. H. Nicholls in *Vict. Nat.* 53: 72, 73 fig. A-H (1936).

Illust.: Nicholls (*l.c.*).

Vern.: Leek-orchid. *Distr.*: Endemic in Victoria where extremely localized, rare, and known only by the type collection from Pomonal near the eastern Grampians (Oct.-Nov. 1932).

—Labellum broadly *deltoid*, *ovate* or *almost orbicular*, the margins *entire*; callus prominently raised, wholly *green*; lateral sepals often \pm *connate* toward base:

839. *P. parviflorum* (Rogers) W. H. Nicholls in *Vict. Nat.* 57: 191, 192 fig. A-I (1941).

P. hartii R. S. Rogers var. *parviflorum* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 54: 44 (1930).

Illust.: Nicholls (*l.c.*).

Vern.: Slender Leek-orchid. *Distr.*: Apparently endemic in Victoria, on swampy ground in heaths or low-lying tracts of open sandy woodland along the far western and eastern coasts, where ranging disjunctly but sometimes locally plentiful (Nelson, Portland district, Wonthaggi, Wilson Prom., Yarram & Port Albert, Bairnsdale, Marlo, Genoa Ck), with an isolated inland record from Beechworth; its occurrence also in far southern N.S.W. is to be anticipated.

18. Sepals 7 mm. long or more, the lateral pair usually bidentate at tips; labellum *never* at once orbicular and with obscure callus 20
Sepals and other segments <7 mm. long or, if occasionally 7 mm., then the labellum \pm orbicular with obscure callus; flowers *rather few* (to 16) in a short loose spike (to 4" long). 19
19. Lateral sepals *free*, *acute*, \pm bidentate at tips; labellum shortly clawed, *ovate-lanceolate*; callus prominently raised and extending *almost to apex* (flowers green or brownish, usually very fragrant, appearing Sept.-Nov.):

840. *P. fuscum* R. Br. *Prodr. Flor. Nov. Holl.* 318 (1810).

Illust.: Nicholls, *Proc. roy. Soc. Vict.* new ser. 46: 35 fig. H-O (1933); Nicholls in Barrett, *Sun Nature Book* n. 5: 17 (1934); Rodway, *Some Wild Flowers Tasm.* t. on 105 (1910); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 112 fig. B, col. (1858).

Vern.: Tawny Leek-orchid (Fly Orchid—Tas.). *Distr.*: Scattered through open forest, savannah-woodland or drier grassland of western Victoria, but uncommon and becoming rare (near Kaniva, Grampians, Arafat, Creswick, Bendigo, Brisbane Range, Lara & St. Albans on Keilor basal plains near Melbourne, Berwick), with isolated occurrences at Wonthaggi and Nathalia; also Tas., N.S.W. (Kiandra, Blue Mtns. and rare).

—Lateral sepals *free*, *bluntish*; labellum \pm sessile, *ovate-lanceolate*, with undulate pinkish margins; callus prominent, reaching *just beyond the bend* (flowers dark greenish, usually suffused with pink, faintly scented, appearing Nov.-Jan.):

841. *P. rogersii* H. M. R. Rupp in *Proc. Linn. Soc. N.S.W.* 53: 340 (1928).

Illust.: Nicholls in Barrett, *Sun Nature Book* n. 5: 19 (1934).

Vern.: Marsh Leek-orchid. *Dist.*: Extremely localized and rare in Victoria where known by only two collections from the far south-west and far east respectively. viz. Mt. Clay near Portland (Nov. 1958) and Mallacoota (Jan. 1930); Tas. (Cradle Valley at 3000 ft. alt., Knocklofty near Hobart), N.S.W. (Barrington Tops at 5000 ft. alt.—type locality), N.Z. (Kaitaia in central N. Id at 4-5000 ft.)

—Lateral sepals *connate in basal half, acuminate*; labellum \pm sessile, *orbicular*, with sharply contracted and reflexed, \pm caudiform apex; callus *short and inconspicuous* (flowers purplish, appearing Nov.):

842. *P. appendiculatum* W. H. Nicholls in *Vict. Nat.* 66: 212, 213 fig. F-I (1950).

Illust.: Nicholls (*l.c.*).

Vern.: Leek-orchid. *Dist.*: Apparently endemic in far eastern Victoria, on damp sandy ground of the near-coastal "grass-tree plains" (Tonghi plain near Cann R., type locality at Genoa Ck, Mallacoota), but almost certainly extending beyond the Howe Range into similar terrain of far southern N.S.W.

—As for the last, but labellum \pm *lanceolate* and with *prominent callus* extending almost to apex (alpine plant, flowering Dec.-Feb.):

P. alpinum R. Br. [See No. 830].

20. Labellum *ovate*, very broad at base, suddenly contracted reflexed and \pm *undulate-crenulate in upper third*; callus *prominently raised*, reaching *just beyond bend*, with *verrucose-glandular* thickened margins (flowers \pm crowded on a robust spike):

843. *P. hartii* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 51: 8 (1927).

Illust.: Nicholls, *Vict. Nat.* 57: 192 fig. J-O (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 18 (1934).

Vern.: Maroon Leek-orchid. *Dist.*: Endemic in Victoria where scattered on moister tracts of near-coastal heaths and open forest between the Lower Glenelg R. and Orbost (Nelson, Portland district, Beaconsfield-Pakenham area, Yarram, Bairnsdale), with an isolated inland occurrence at Cobungra, but now much reduced and becoming rare through clearing of its habitat for farmland.

—Labellum *ovate-lanceolate*, *not* sharply contracted in upper part; callus often extending well beyond bend, usually \pm channelled but *not* glandular

21. Labellum manifestly *constricted* just beyond bend, the narrowish margins only slightly undulate; callus *prominently raised*, *extending almost to apex*, in side-view conspicuous above the \pm recurved labellum-margins

Labellum *without any constriction*, the wide pale margins *crispate-undulate* throughout; callus neither much raised *nor* extending to near apex, \pm hidden from side-view by the slightly incurved labellum-margins

22. Scape *slender*, <18" tall; lateral sepals \pm *parallel* or slightly divergent; petals *blunt*, \pm *recurved*, < $\frac{3}{4}$ the length of sepals; flexure of labellum \pm 70°, its tip obscured; callus *not* or hardly channelled, reaching slightly beyond bend (plant of dryish places, flowering Sept.-Dec.):

844. *P. patens* R. Br. *Prodr. Flor. Nov. Holl.* 318 (1810).

Illust.: Goldsack, *S. Aust. Nat.* 22³: 4 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 16 (1934); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 33: t. 9 A (1909); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 109 fig. B, col. (1858), as "*P. truncatum*".

Vern.: Broad-lip Leek-orchid (Pale Leek-orchid). *Distr.*: Excepting the Mallee, alps, grassland plains and agricultural areas, widely scattered through Victoria in a variety of habitats, but only occasional and precise range uncertain owing to much confusion in the past with other species (Grampians, Hawkesdale, Anglesea, Gisborne, Whipstick Scrub near Bendigo, Heathmont-Bayswater area, Beaconsfield, Wonthaggi, Yarram, Mt. Howitt, Orbost & Marlo, Club Terrace, Combienbar, Genoa R.); all States except W.A., but only in the south-east of Qd.

—Scape \pm stout. (to 9 mm. thick), 18-30" tall; lateral sepals manifestly spreading; petals acute, incurved, $>\frac{3}{4}$ the length of sepals; flexure of labellum only $\pm 90^\circ$, its tip easily visible from behind sepals; callus channelled, extending $>$ half way between bend and labellum-tip (plant of inundated swampy ground, flowering late Dec. to early Mar.; leaf-lamina withering before anthesis, and flowers near centre of inflorescence opening first):

845. *P. diversiflorum* W. H. Nicholls in *Vict. Nat.* 59: 8, 12 fig. A-L (1942).

Illust.: Nicholls (*l.c.*).

Vern.: Gorae Leek-orchid. *Distr.*: Known solely from the type locality at "Mal-seeds", Gorae West near Portland, S.W. Victoria, where confined to black loamy soil on a heavily timbered flat (along a natural watercourse and, during winter, flooded to a depth of 2 ft. or more).

[This orchid may now be extinct, since the conversion to agricultural land of its only known habitat; it had previously appeared in quantity during several successive years, 1941-48. The key characters given above are entirely from information supplied by the discoverer of *P. diversiflorum*, Mr. A. Cliff. Beaglehole (of Gorae West) who alone has any knowledge of the living plant. Its epithet is most unfortunate; because, except for a single aberrant colony in one season (early 1942), the floral characteristics of the species were remarkably uniform.]

23. Flowers often with brown or purplish tints; ovary and labellum both sessile; lateral sepals always free:

846. *P. frenchii* F. Muell. in *Vict. Nat.* 6: 126 (1889).

Illust.: FitzGerald, t. col. (?1894)—separate plate; Nicholls in Barrett, *Sun Nature Book* n. 5: 17 (1934); Dickins, *Vict. Orchids* 8 fig. 15 (1929); Pescott, *Orchids Vict.* t. inter 64 & 65 (1928), also *Vict. Nat.* 43: t. 11 (1926).

Vern.: Slaty Leek-orchid (French's & Stout Leek-orchid). *Distr.*: Scattered through cooler parts of Victoria both in sandy coastal heathlands and more open inland forest tracts, ascending to the sub-alps and locally rather common (Portland district, Grampians, Kewell near Minyip, Maryborough, Gisborne, Otways, Bayswater-Croydon area, Dandenongs, Healesville & Warburton, Mt. Eliza, Tooradin, Foster, Yarram, Mt. Wellington, Beechworth), but in East Gippsland noted only about Mallacoota; also Tas., N.S.W. (rare—Urana, Mt. Kosciusko).

—Flowers yellowish-green; ovary *shortly stalked*; labellum on a short but *distinct claw*; lateral sepals *connate* in lower third:

847. *P. gracile* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 33: 213, t. 12 A (1909).
? *P. pyriforme* E. Coleman in *Vict. Nat.* 49: 195, t. 14 (1932); *l.c.* 245 (1933).

Illust.: Fiveash in Rogers (*l.c.*); Coleman (*l.c.*); Nicholls in Barrett, *Sun Nature Book* n. 5: 18 (1934); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 37: t. 7 A (1913); *Orchid Rev.* 30: 35 (1922).

Vern.: Graceful Leek-orchid (Slender Leek-orchid). *Distr.*: Almost co-extensive in Victoria with *P. frenchii* (*q.v.*), but tolerating an even wider range of habitats, commoner in Gippsland, and collected also from several other localities (*viz.* Hawkesdale, Pomonal, Ararat, Boort, Grantville, Wilson Prom., Sale, Bairnsdale, Wonnangatta R. valley, Cobungra, Suggan Buggan); Tas., S.A. (Sander-grove, Bridgewater), N.S.W. (Central Tableland including Blue Mtns.).

[The original description and plate of *P. pyriforme* E. Coleman (1932), based on material from Wonga Park near Croydon, Vic., conform well to the circumscription of *P. gracile*—e.g. pallid green flowers, connate lateral sepals and clawed labellum, which are the very features which serve to distinguish *P. gracile* from its close congener *P. frenchii*. Further research may, indeed, prove the specific separation of *P. gracile* from *P. frenchii* to be unwarranted.]

267. CALEANA R. Br. (1810)

1. Leaves \pm 5 mm. wide; scape 6-18" high; flowers large (to 2 cm. long, nigger-brown; labellum ovoid, *destitute of glands*, irritable on a slender strap-like claw and resembling a duck's head:

848. *C. major* R. Br. *Prodr. Flor. Nov. Holl.* 329 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1st: t. col. (1880); Chisholm in Rupp, *Aust. Encycl.* 6: 412 A (1958); Goldsack, *S. Aust. Nat.* 22nd: 2 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 301 c (1943); Henty & Rogers, *Wild Life* 4: 304-305 (1942); Reeves, *Wild Life* 1: 21 (Oct. 1938); Nicholls, *Vict. Nat.* 53: 182 fig. A-E (1937); Nicholls in Barrett, *Sun Nature Book* n. 1: 23 fig. 5, col. (1932), also n. 5: 20 (1934); Arnold in Ewart, *Flor. Vict.* frontisp. fig. 5, col. (1931); Dickins, *Vict. Orchids* 14 fig. 23 (1929); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 4, col. (1928); Morris in Rogers, *Vict. Nat.* 43: 181 fig. 1 (1926); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 64 fig. 1 (1914); Sulman, *Some Familiar Wild Flowers* t. 44 (1913); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 25 (1911); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 107 fig. A, col. (1858); Bauer in Pfitzer, *Natürl. PflFam.* 2nd: fig. 101 (1889).

Vern.: Large Duck-orchid (Flying Ducks, Bee Orchid, Cockatoo Orchid—Tas.). *Distr.*: Except for the Mallee, alps, heavier forests, grasslands and agricultural areas, widespread through Victoria where favouring drier, open woodlands, but scattered and seldom common (e.g. Grampians, near Boort, Lal Lal district, Brisbane Range, Otways, Coimadaí & Gisborne, Creswick, Campaspe R., Rushworth, Chiltern, Frankston & Cranbourne, Tonimbuk, Strzelecki Range, Toongabbie-Traralgon area, Alberton, Fulham near Sale, Mt. Wellington, Marlo & Cabbage-tree Ck, Bemm R., Reedy Ck, Genoa, Maramingo Ck); all States except W.A., but only south-east in Qd.

—Leaves <5 mm. wide; scape up to 6" high; flowers small (to 1 cm. long), pale reddish-brown or greenish; labellum \pm *glandular*

2. Labellum *irritable*, deeply pigmented, shortly apiculate, copiously beset with dark glands; tip of column entire or with shallow sinus; anther present and functional:

849. *C. minor* R. Br. *Prodr. Flor. Nov. Holl.* 329 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1⁶: t. col. (1880); Nicholls, *Vict. Nat.* 53: 182 fig. F-J (1937); Nicholls in Barrett, *Sun Nature Book* n. 5: 20 (1934); Dickins, *Vict. Orchids* 14 fig. 24 (1929); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 64 fig. 2 (1914); Hatch, *Trans. roy. Soc. N.Z.* 79: t. 72 fig. 1 (1952).

Vern.: Small Duck-orchid. *Distr.*: Scattered through western Victoria and Gippsland, usually on damp heath, but of very discontinuous range and mostly rare (Black Range & Grampians, Brisbane Range, Gisborne, Rushworth, Port Albert, Bairnsdale district, Sperm Whale Head, Marlo); all States except W.A., but very localized in S.A. (Longwood, Kuitpo Forest) and Qd (extreme south-east), also in N.Z. (Kaitaia and Rotorua-Waiotapu region in North Id).

—Labellum *fixed*, *pallid*, sparsely glandular, with long-pointed apex; tip of column bifid, the wide wings usually forming a deep sinus around the rostellum; anther apparently *lacking*:

850. *C. sullivanii* (F. Muell.) E. E. Pescott in *Vict. Nat.* 43: 228 (1926).

Caleya sullivanii F. Muell. in *Chem. & Drugg. Lond. Aust. Suppl.* 4: 44 (1882).

Illust.: Nicholls, *Vict. Nat.* 53: 182 fig. κ-o (1937), also 48: 222 (1932); Nicholls in Barrett, *Sun Nature Book* n. 5: 20 (1934).

Vern.: Spectral Duck-orchid. *Distr.*: Endemic in the Grampians and Black Range of western Victoria, where rather widespread but uncommon, inhabiting mossy depressions and soaks among rocks (Mts. Byron, Zero & William, Wonderland near Hall's Gap, Serra Range).

[A. J. Swaby in *Vict. Nat.* 53: 183-185 (1937) suggests the possibility that *C. sullivanii* is a freakish, antherless development (having non-mobile labellum) of *C. minor* with which it is invariably associated in the field.]

268. SPICULÆA Lindl. (1840)

851. *S. huntiana* (F. Muell.) Schlechter in *Repert. Spec. nov. Regn. veg.* 17: 83 (1921).

Drakæa huntiana F. Muell. in *Vict. Nat.* 8: 174 (1889).

Illust.: *Wild Life* 12: 80 (1950); Willis, *Vict. Nat.* 64: 246 (1948); Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. L, col. (1934); Dickins, *Vict. Orchids* 14 fig. 26 (1929); Pescott, *Orchids Vict.* t. opp. 65 (1928), also *Vict. Nat.* 37: t. 5 fig. 4 (1921), the latter as "*Drakæa huntiana*"; Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 42: t. 4 (1918), as "*Drakea huntiana*".

Vern.: Elbow Orchid. *Distr.*: Scattered throughout the Victorian highlands from sea-level to >5000 ft. alt., often in open drier forests and in some seasons locally abundant, but usually overlooked (e.g. Grampians, Creswick & Egans-town, Gisborne district, Otways, Kinglake Nat. Park, Dandenongs, Healesville & Marysville, Mts. Buffalo, Cobbler, Howitt, Kent & Wellington, Dargo High Plains, Yarragon, Moe, Maffra, Orbost, Mallacoota, Bendoc, Nunniong Plateau, Cravensville near Mt. Benambra); also N.S.W. (as far north as Blue Mtns.), flowering Dec.-Feb.

Diagn.: Leafless and apparently saprophytic herb: flowering stems slender, 3-8" high, bearing 2-4 loose sheathing bracts from base and terminating in a loose raceme of 2-6 green or reddish flowers of bizarre structure; 3 sepals and 2 petals all \pm equal, 4-5 mm. long, blunt, narrow-oblong to linear, sharply deflexed; lamina of labellum 6-8 mm. long, insectiform, chiefly reddish-purple, consisting of 3 conspicuous, globular, shining, dark-purple, proximal glands (1 sessile, 2 on paired stalks to 1 mm. long), a darkly hairy intermediate portion and 2 long, divergent, paler distal tails (\pm 3-4 mm. long) bearing a few long scabrid hairs or laciniae; labellum-claw slender, 5-7 mm. long, glabrous, attached at proximal third of lamina and articulate by a movable joint or hinge to the narrow-linear, elongated column-foot (5-7 mm. long); column strongly arched away from ovary, with 4 slender acuminate lobes (2-3 mm. long) that curve in pairs above and below the anther; ovary ellipsoid, \pm 4 mm. long, on slender pedicels of 6-10 mm.

[The record in Ewart's *Flor. Vict.* 311 (1931) of *S. irritabilis* (F. Muell.) Schlechter—as "*Drakæa irritabilis* Reich."—is based upon what seems to have been an inadvertent slip by F. Mueller, when recording the additions to his *Key to the System of Victorian Plants* (1886-88) in *Vict. Nat.* 7: 50 (Aug. 1890). Instead of the obvious *Drakæa huntiana* (L.c.), then known only from the single type specimen (Mt. Tingiringi, on the Vic.-N.S.W. border), Mueller wrote "*D. irritabilis*". No Victorian collection of the latter, very different New South Wales and Queensland species is represented in any herbarium, and the name should be deleted from the flora of Victoria.]

269. CHILOGLOTTIS R. Br. (1810)

1. Petals *deflexed* against the ovary, usually dark coloured; labellum obovate to broadly rhomboid, on a long basal claw 3
 Petals *not* or only slightly deflexed; labellum elliptical to ovate, very shortly clawed (but mobile) 2
2. Flowers green or tinted with purplish-brown, opening freely, 2-3 cm. wide; labellum dark coloured, broadly ovate, waxy, with a large thick sessile gland near centre, 1 long-stalked capitate gland at the base and 2 rather irregular rows of smaller stalked calli between:

852. *C. gunnii* Lindl. *Gen. & Spec. orchid. Plant.* 387 (1840).

Illust.: FitzGerald, *Aust. Orchids* 2²: t. col. (1885); Clark, *Wild Life* 7: 262 (1945); Garnet, *Wild Life* 3: 475 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 21 (1934); Ewart, *Flor. Vict.* fig. 161 (1931); Rupp, *Guide Orchids N.S.W.* 123 (1930); Dickins, *Vict. Orchids* 24 fig. 38 (129); Pescott, *Orchids Vict.* t. opp. 49 (1928), also *Vict. Nat.* 43: t. 12 (1926); Rodway, *Tasm. Flor.* t. inter 208 & 209 (1903); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 108 fig. B, col. (1858).

Vern.: Common Bird-orchid. *Dist.*: Very widespread through forests of the Victorian highlands, ascending to above 5000 ft. alt. in the alps and often common in cool shaded places where it may form extensive colonies on humus-rich soil (e.g. Grampians, Mt. Cole, Creswick, Heathcote, Macedon, Gisborne, Lerderg Gorge, Brisbane & Otway Ranges, Arthur's Seat, Dandenongs, Kinglake Nat. Park, Kilmore, Strathbogie, Mts. Timbertop, Buffalo, Cobbler, Howitt & Skene, Lake Mtn. & Baw Baws, Strzelecki Ranges, Wilson Prom., Avon Ranges, Barry Mtns., Dargo & Bogong High Plains, Cobungra, Cobboras, Genoa R., Upper Delegate R., Mt. Ellery, Orbost and many other parts of East Gippsland); also Tas., N.S.W. (alps & higher tablelands).

—Flowers *pale greenish*, tardily opening; labellum narrowly ovate, with variable number of green or coloured *sessile* calli (4 of these wide glands often forming a cross toward centre of lamina):

853. *C. cornuta* Hook. f. *Flor. antarct.* 1: 69 (1844).

C. muelleri R. D. FitzG. *Aust. Orchids* 2²: + t. col. (1885).

Illust.: FitzGerald (l.c.); Garnet, *Wild Life* 3: 486 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 22 (1934); Dickins, *Vict. Orchids* 24 fig. 40 (1929); Hatch, *Trans. roy. Soc. N.Z.* 77: t. 15 fig. 1 (1949); Smith in Cheeseman, *Ill. N.Z. Flor.* 2: t. 198 fig. A (1914)—all except the last two as "*C. muelleri*".

Vern.: Green Bird-orchid. *Dist.*: Occasional in southern highlands of eastern Victoria where one of the most shade-tolerant orchids, favouring the subdued light of fern gullies, in damp mountain-forest and growing often on tree-fern butts or rotting logs (Kinglake Nat. Park, Dandenongs, Gembrook & Beenak, Healesville and Warburton, Fernshaw, Upper Royston R., Baw Baws, Bass R. & Strzelecki Ranges, Mt. Ellery—but rare in E. Gippsland), with isolated western occurrences in the Otways; also Tas. (north, but perhaps overlooked elsewhere), N.Z. (widespread), Auckland & Campbell Is.

—Flowers *dark reddish-brown*, with slightly reflexed segments; labellum *broadly elliptic, rounded at apex*, with 1 large sessile gland toward centre, a large stalked bilobed one (or 2 separate calli) toward base, and numerous smaller stalked calli scattered between centre and base:

854. *C. pescottiana* R. S. Rogers in *Proc. roy. Soc. Vict.* new ser. 30: 139, t. 25 (1918).

Illust.: Fiveash in Rogers (l.c.); Garnet, *Wild Life* 3: 486 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 21 fig. B (1934); Nicholls, *Vict. Nat.* 48: 232 (1932).

Vern.: Bronzy Bird-orchid (Alpine Bird-orchid). *Dist.*: Extremely localized and rare in Victoria where known only from Cravensville (Upper Tallangatta Ck valley), inhabiting moist shady places on forested slopes, but long-continued grazing by sheep has jeopardized its existence there; also Tas. (Mt. Barrow).

3. Leaves *stem-clasping*; labellum obovate to almost rhomboid, with variously shaped calli \pm arranged in 2 rows and with 1 or 2 much larger *reflexed* calli near the claw (flowering Mar.-Aug.):

855. *C. reflexa* (Labill.) Druce in *Rep. bot. (Soc.) Exch. Cl. Manchr* 1916: 614 (1917).

Epipactis reflexa Labill. *Nov. Holl. Plant. Specim.* 2: 60, t. 211 fig. 1 (1806).

Illust.: Labillardière (l.c.); FitzGerald, *Aust. Orchids* 2²: t. col. (1885), as "*C. diphylla*"; Clark, *Wild Life* 8: 72 (1946); Reeves, *Wild Life* 7: 81 (1945); Garnet, *Wild Life* 3: 486 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 21 (1934); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 65 fig. 1 (1914), as "*C. diphylla*"; Rodway, *Some Wild Flowers Tasm.* t. on 110 (1910), also *Tasm. Flor.* t. inter 208 & 209 (1903)—both as "*C. diphylla*"; Bauer, *Ill. Flor. Nov. Holl.* t. 8 (1813), as "*C. diphylla*".

Vern.: Autumn Bird-orchid. *Dist.*: Scattered through the cooler parts of southern Victoria from Portland district to the Howe Range, but chiefly on loose sandy soil under bracken or forest shrubs near the coast where locally abundant

(Grampians, Otways, Cranbourne, Healesville, Tonimbuk, Grantville, Foster & Hedley, Yarram, Sale, Bairnsdale district, Orbost & Marlo, Wulgulmerang, Mt. Ellery, Reedy Ck near Cann R.); Tas., N.S.W., Qd (south-east).

—Leaves *petiolate*; labellum-lamina broadly rhomboid (trapeziform), with a *single cluster* of closely packed small calli forming a tubercular lustrous gland at the centre (flowering Sept.-Nov.):

856. *C. trapeziformis* R. D. FitzG. *Aust. Orchids* 1³: + t. col. (1877).

Illust.: FitzGerald (*l.c.*); Nicholls in Barrett, *Sun Nature Book* n. 5: 21 (1934); Nicholls in Pescott, *Vict. Nat.* 50: 116 (1953).

Vern.: Dainty Bird-orchid (Broad-lip Bird-orchid). *Distr.*: Dispersed through Gippsland and north-eastern Victoria, usually uncommon to rare in highland areas but locally frequent on certain sandy tracts of near-coastal forest (Croydon where now very rare, Sale, Stockdale near Stratford, Bairnsdale-Paynesville district, Bruthen, Brodribb R., Cann R., Cravensville & Tallangatta, Shelley in Far North-east, Mitta Mitta, Upper Ovens R.); also N.S.W., Qd (far south).

270. *ACIANTHUS* R. Br. (1810)

1. Perianth segments *long and filiform* (to 3 cm.), dark purplish; flowers few (1-5) on scape, often \pm malodorous; leaf purple beneath:

857. *A. caudatus* R. Br. *Prodr. Flor. Nov. Holl.* 321 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1⁷: t. col. (1882); Bishop, *Wild Life* 6: 271 (1944); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 299 i (1943); Garnet, *Wild Life* 2: 40 (July 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 22 (1934); Dickins, *Vict. Orchids* 10 fig. 17 (1929); Pescott, *Orchids Vict.* t. opp. 65 (1928), also *Vict. Nat.* 41: t. 8 fig. 3 (1925); Coleman, *Gum Tree* 5: 8 fig. 6 (Dec. 1920); Rodway, *Some Wild Flowers Tasm.* t. on 95 (1910); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 119 fig. B, col. (1858).

Vern.: Mayfly Orchid ("Dead Horse"). *Distr.*: Scattered through southern Victoria, favouring cool shaded situations in light forest, but abundant only on sandy ground near the coast (Mt. Clay north-east of Portland, Grampians, Otways, Brisbane Range, Frankston-Langwarrin area where now rare, Heathmont, Healesville, Beaconsfield, Grantville, Sunday Id in Corner Inlet, Wilson Prom., Bairnsdale, Newmerella, Marlo, Reedy Ck near Cann R.); N.S.W., Tas., S.A. (rare).

—Perianth segments *never* long-filiform (1 cm. or less), green to reddish; flowers apparently odourless

2. Leaf usually *green* beneath; flowers 1-6, the segments about 1 cm. long; lateral sepals deflexed, never crossed or gland-tipped; column *sharply bent forward*, \pm 6 mm. long:

858. *A. reniformis* (R. Br.) Schlechter in *Bot. Jb.* 39: 39 (1906).

Cyrtostylis reniformis R. Br. *Prodr. Flor. Nov. Holl.* 322 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1⁴: t. col. (1878), as "*Cyrtostylis reniformis*"; Erickson, *Orchids of the West* t. 23, col. (1951); Goldsack, *S. Aust. Nat.* 22³, 2 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 299 iii (1943); Garnet *Wild Life* 2: 41 (July 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 22 (1934); Nicholls, *Vict. Nat.* 50: 23 fig. i-j (1933); Ewart, *Flor. Vict.* fig. 155

(1931), as "*Cyrtostylis reniformis*"; Dickins, *Vict. Orchids* 10 fig. 19 (1929); Pescott, *Orchids Vict.* t. inter 32 & 33 (1928), also *Vict. Nat.* 43: t. 15 (1927); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 20 (1911); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 119 fig. c, col. (1858); Hooker, *J. Bot., Lond.* 1: t. 135 (1834); Hatch, *Trans. roy. Soc. N.Z.* 76: t. 57 fig. 2 E-K (1947), as "var. *oblongus*"—the last 5 but one (viz. Pescott to Hooker) as "*Cyrtostylis reniformis*".

Vern.: Mosquito Orchid (Gnat Orchid). *Distr.*: Except for the Mallee, alps, heavier forests, northern plains and agricultural areas, very widespread through Victoria, both on shaded stony hill-slopes and loose sandy soils of the coast where often abundant amongst shrubberies of *Leptospermum laevigatum* (e.g. in such distantly separated localities as Lower Glenelg R., Portland, Gram-pians, Little Desert, St. Arnaud & Bealiba, Mts. Langi-Ghiran & Beckworth, Werribee Gorge, You Yangs & Brisbane Range, Otways, Torquay, Morning-ton Penins. Dandenongs, Heathcote, Tallarook, Chiltern, Ovens R., Quail Id in Western Port, Wonthaggi, Wilson Prom. & Sunday Id, Yarram, Sale, Bairnsdale, Marlo, Suggan Buggan, Howe Ranges); all States, but in Qd only the south-east, also N.Z.

—Leaf reddish-purple beneath; flowers 3-15, the segments <1 cm. long (labellum usually 3-5 mm); lateral sepals acuminate, often crossed and gland-tipped; column gently curved, 2-3 mm. long:

859. *A. exsertus* R. Br. *Prodr. Flor. Nov. Holl.* 321 (1810).

Illustr.: FitzGerald, *Aust. Orchids* 1st: t. col. (1875); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Garnet, *Wild Life* 2: 40 (July 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 22 (1934); Nicholls, *Vict. Nat.* 50: 23 fig. k-1 (1933); Rupp, *Guide Orchids N.S.W.* 126 (1930); Dickins, *Vict. Orchids* 10 fig. 18 (1929); Pescott, *Orchids Vict.* t. opp. 81 (1928), also *Vict. Nat.* 43: t. 17 (1927); Coleman, *Gum Tree* 5: 8 fig. 5 (Dec. 1920); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 19 (1911); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 119 fig. A, col. (1858).

Vern.: Gnat Orchid (Mosquito Orchid). *Distr.*: Almost co-extensive in Victoria with *A. reniformis*, but even more widespread and frequent on sandy near-coastal tracts, extending to Hawkesdale, Portarlington, Bendigo and Tallangatta districts, and being probably the commonest autumnal to early winter orchid of East Gippsland; all States except W.A. (?), but in Qd only the south-east.

[In the Warby Ranges, near Wangaratta, is a population differing from typical *A. exsertus* in its larger darker labellum and comparatively longer petals—thus approaching the New South Wales *A. fornicatus* R.Br. which has a very broad cucullate dorsal sepal and glandular labellum.)

271. ERIOCHILUS R. Br. (1810)

860. *E. cucullatus* (Labill.) Reichenb. f. *Beitr. syst. PflK.* 27 (1871).

Epipactis cucullata Labill. *Nov. Holl. Plant. Specim.* 2: 61, t. 211 (1806);

Eriochilus autumnalis R. Br. *Prodr. Flor. Nov. Holl.* 323 (1810).

Illustr.: Labillardière (*l.c.*); FitzGerald, *Aust. Orchids* 2nd: t. col. (1885); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 298 c (1943); Goldsack, *S. Aust. Nat.* 22³: 4 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 23 (1934); Rupp, *Guide Orchids N.S.W.* 127 (1930); Dickins, *Vict. Orchids* 2 fig. 3 (1929); Pescott,

Orchids Vict. t. opp. 81 (1928); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 67 fig. 1 (1914); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 11 (1911); Rodway *Tasm. Flor.* t. opp. 208 (1903); Meredith, *Bush Friends Tasm.* t. 3, col. (1860); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 120 fig. A, col. (1858); Bauer in Endlicher, *Icon. Gen. Plant.* t. 6 (1838)—the 2nd (FitzGerald) and last 7 (Pescott to Bauer) as "*E. autumnalis*".

Vern.: Parson's Bands. *Dist.*: Very widespread through Victorian woodlands and heaths, from sea-level to sphagnum bogs in the alps at 4500-5000 ft. alt. and often frequent, but avoiding the Mallee, the heavier mountain-forests and jungles (e.g. in areas as dispersed as Lower Glenelg R., Portland, Grampians, Dimboola, Diapur near Nhill, Bendigo, Maryborough, Creswick, Gisborne, Brisbane Range & You Yangs, Otways, Arthur's Seat, Heathmont & Kalorama, Kinglake Nat. Park, Graytown, Rushworth, Delatite R. & Mt. Timber-top, Dargo High Plains where robust and pink-flowered, Mt. Wellington, Sale, Suggan Buggan and common almost throughout East Gippsland); all States except W.A., flowering in autumn.

Diagn.: Glandular-hairy to almost glabrous herb, the underground tuber \pm globular; leaf radical, solitary, ovate, acute, 1-2 cm. long, usually grey-green, often much reduced or absent at flowering time (developing afterwards), embraced below by a large hyaline bract; peduncles slender, almost filiform, 2-9" high (usually 4-6"), bearing 1 or 2 (rarely 3) pale, delicately scented flowers, each subtended by a very broad, \pm hyaline, truncate bract 3-5 mm. long; dorsal sepal green or brownish, 6-8 mm. long, oblanceolate to spatulate, erect; lateral sepals horizontally spreading or deflexed, white or variably pink, far larger than all other segments, 10-16 mm. long, narrowly elliptic to oblanceolate (resembling the bands of a clerical neckpiece); petals greenish, linear, erecto-patent (like 2 raised arms), 5-7 mm. long; labellum about as long as petals, the erect basal half (or $\frac{2}{3}$) glabrous, the distal part strongly recurved, dilated to 2-3 mm. wide and beset with a fuzz of bronzy or pinkish papillæ (arranged in \pm transverse ridges); column erect, 5-6 mm. high, narrowly winged below the large, prominently concave stigma (\pm 1.5 mm. wide); anther \pm 1 mm. long; ovary slender, 6-12 \times 1-1.5 mm.

272. LYPERANTHUS R. Br. (1810)

Leaf prostrate, broadly ovate to rotund, thick and fleshy, 1-2" wide; flowers often deflexed, heavily veined with purplish-red, drying to jet-black; lateral sepals and petals linear, bluntish; mid-lobe of labellum toothed or fringed (flowering indifferently, except after fire when often copious):

861. L. nigricans R. Br. Prodr. Flor. Nov. Holl. 325 (1810).

Illustr.: FitzGerald, *Aust. Orchids* 1^a: t. col. (1878); Fiveash in Rupp, *Aust. Encycl.* 6: 412 B fig. 1, col. (1958); Dell in Gardner, *Wildflowers W. Aust.* 16, col. (1959), also *W. Aust. Wildflowers* 21, col. (1938); Forster in Harris, *Wild Flowers Aust.* t. 46, col. (1947); Kaines, *Wild Life* 9: 267 (1947); Clarke, *Wild Life* 7: 261 (1945); Garnet, *Wild Life* 5: 333 (1943); Scammell in Rupp, *Orchids N.S.W.* t. 8 opp. 54 (1943); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 298 B (1943); Goldsack, *S. Aust. Nat.* 22³: 4 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 23 (1934), also n. 1: 22 fig. 8, col. (1932); Ewart, *Flor. Vict.* fig. 156 (1931); Dickins, *Vict. Orchids* 12 fig. 20 (1929); Pescott, *Orchids Vict.* t. inter 32 & 33 (1928), also *Vict. Nat.* 43: t. 15 (1927); Pelloe, *Wildflowers W. Aust.* 48 (1921); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 30 (1911); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 106 fig. B, col. (1858); Bauer in Endlicher, *Icon. Gen. Plant.* t. 7 (1838).

Vern.: Red-beaks (Red-beak Orchid, Undertaker Orchid, Black Orchid—Tas.).
Distr.: Widespread, and often very abundant, on both damp and drier heaths throughout far-western and southern Victoria (e.g. Lower Glenelg R., Portland, Poolaigelo, Grampians, Big & Little Deserts, Anglesea, Black Rock & Cheltenham area, Wonthaggi, Wilson Prom., Sale, Marlo, Noorinbee, Reedy Ck near Cann R., Suggan Buggan); all States except Qd.

Leaf *erect*, linear to linear-lanceolate, much <1" wide; flowers *yellowish to dark brown*, fragrant, usually spreading; lateral sepals and petals narrow-linear, *acuminate*; mid-lobe of labellum *entire*, recurved:

862. *L. suaveolens* R. Br. *Prodr. Flor. Nov. Holl.* 325 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1⁴: t. col. (1878); Clark, *Wild Life* 7: 261 (1945); Garnet, *Wild Life* 5: 333 (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 22 (1934); Ewart, *Flor. Vict.* fig. 157 (1931); Rupp, *Guide Orchids N.S.W.* 128 (1930); Dickins, *Vict. Orchids* 12 fig. 21 (1929); Sulman, *Some Familiar Wild Flowers* t. 46 (1913), as "*Orthoceras strictum*" in err.

Vern.: Brown-beaks. *Distr.*: Scattered through eastern Victoria, both on coastal heaths and stony ground of open inland forests where usually uncommon or occasional (Kinglake Nat. Park, Ringwood-Croydon-Boronia region, Berwick & Officer, Strzelecki Range, Wilson Prom., Marlo, Noorinbee in Cann R. valley, Howe Ranges, Upper Gundowring in Kiewa Valley, Snowy Ck & Ovens R.), with rare western occurrences at Anglesea and Creswick; Tas. (east coast), N.S.W., Qd.

273. BURNETTIA Lindl. (1840)

863. *B. cuneata* Lindl. *Gen. & Spec. orchid. Plant.* 518 (1840).

Illust.: Nicholls, *Wild Life* 8: 404 (1946); Nicholls in Barrett, *Sun Nature Book* n. 5 27 fig. F, col. (1934); Nicholls in Pescott, *Vict. Nat.* 50: 118 (1933); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 13, col. (1928), also *Vict. Nat.* 43: t. 6 fig. 13, col. (1926); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 107 fig. c (1858).

Vern.: Burnettia (Lizard Orchid). *Distr.*: Occasional on wet peaty ground of near-coastal heaths between Port Phillip Bay and Wilson Prom., usually under thickets of *Melaleuca squarrosa*, but becoming rare in Victoria through destruction of its habitat (e.g. Frankston, Ringwood, Emerald & Gembrook districts where now extremely rare or extinct, Drouin & Athlone, Wonthaggi, Foster, Hedley), with isolated occurrences around Portland, in Grampians (Wonderland, head of Fyans Ck) and Reedy Ck near Cann R.; also Tas. (widespread) and N.S.W. (as far north as Blue Mtns.).

Diagn.: Dwarf glabrous herb with globular, subterranean tubers; leaves reduced to 1-3 sheathing, purplish, oblong, pointed bracts (7-15 mm. long) on the flowering peduncle which is 2-4" high; flowers 2-5 (rarely solitary), shortly pedicellate, tardily opening (Sept.-Nov.), purplish-brown or reddish externally, white on the inner surfaces of segments, often striped with conspicuous dark veins; sepals and 2 petals almost equal (or the latter slightly narrower), rigid, thickish, broadly oblanceolate, 8-13 mm. long, 2-4 mm. wide, the dorsal sepal \pm inarched; labellum sessile, broadly obovate, 3-6 mm. long, undivided, slightly recurved towards tip where \pm truncate, whitish with a few dark red veins, the lamina with 2 longitudinal central ridges which break into pale irregular calli toward apex; column \pm 7 mm. long, inarched, rather broadly winged; stigmatic disk \pm 1 mm. diam.; anther conspicuous, 1.5-2 mm. long, apiculate; ovary narrow, 5-7 mm. long, tapering gradually into pedicel.

274. *LEPTOCERAS* (R. Br.) Lindl. (1840)

864. *L. fimbriatum* Lindl. in *Edwards' bot. Reg.* 25; Swan Riv. Append. liii (1840).

Illust.: FitzGerald, *Aust. Orchids* 24: t. col. (1891); Erickson, *Orchids of the West* t. 18, col. (1951); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 298 A (1943); Goldsack, *S. Aust. Nat.* 223: 4 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 23 (1934), also n. 1: 22 fig. 3, col. (1932); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 10, col. (1928), also *Vict. Nat.* 43: 6 fig. 10, col. (1926); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 33 (1911); Ewart, *Plant. indig. Vict.* t. 89 opp. 26 (1910), as "*Caladenia fimbriata*"; Mueller, *Key Syst. Vict. Plant.* 2: fig. 113 (1886), as "*Eriochilus fimbriatus*".

Vern.: Fringed Hare-orchid. *Distr.*: Scattered on near-coastal heaths of southern Victoria, between Portland and Western Port Bays, where mostly uncommon to rare (Airey's Inlet & Anglesea, Black Rock & Cheltenham area), with isolated inland occurrences in the Grampians and near Diapur; also S.A., W.A., flowering autumn and winter.

Diagn.: Glabrous herb with rounded subterranean tuber and fibrous roots; leaves present at flowering time, 1 or 2, radical sessile, sheathing, 2-3 cm. long, ovate to broadly lanceolate, often bluish-green, with 3-5 \pm prominent reddish longitudinal veins; peduncles slender, 6-9" high, with 1-3 stiffly erect, reddish or bronzy flowers on pedicels 5-10 mm. long, their green subtending bracts ovate-lanceolate and 5-8 mm. long; dorsal sepal erect or inarched, \pm elliptic, pointed, 7-9 mm. long, greenish; lateral sepals deflexed against ovary, narrow-linear, acute, 7-10 mm. long, green; petals erect, 10-13 mm. long, oblong-ovate-linear, \pm clavate, glabrous below but roughened by minute reddish glands in distal third; labellum on short movable claw, much wider than long ($\pm 5 \times 9$ mm.), minutely pubescent, obscurely 3-lobed, the anterior margins of lobes with a conspicuous fringe of reddish-purple calli (or laciniae) to 1.5 mm. long, the green lamina dotted with red but devoid of calli; column incurved, 5-6 mm. long, rather widely winged; stigma triangular, obscure, anther bent forward, relatively large (1.5-2 mm. long); ovary narrow, 6-10 \times 1.5-2 mm., pedicellate.

275. *CALADENIA* R. Br. (1810)

[The following key is designed for normal specimens and it may not suffice to identify certain *un-pigmented* examples which occur now and then among the populations of almost any species.]

1. Lateral petals about *twice as long as the sepals, erect, clavate*, dark reddish, ± 2 cm. long; sepals broad, the dorsal one hooded; labellum ovate, ± 7 mm. long, with entire margins; column barred with transverse pink striæ (leaf glabrous, ovate-lanceolate, 1-2" long; flowers pink and white);

865. *C. menziesii* R. Br. *Prodr. Flor. Nov. Holl.* 325 (1810).

Illust.: FitzGerald, *Aust. Orchids* 24: t. col. (1891); Erickson, *Orchids of the West* t. 29 fig 45 (1951); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 297 i (1943); Goldsack, *S. Aust. Nat.* 223: 4 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 26 (1934); Nicholls, *Vict. Nat.* 47: t. 4 fig 18 (1931); Dickins, *Vict. Orchids* 4 fig. 4 (1929); Pelloe, *Wildflowers W. Aust.* 54 (1921); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 121 fig. A, col. (1858).

Vern.: Hare Orchid (Rabbit Orchid—W.A.). *Distr.*: Scattered through southern Victoria and locally common on moist sandy ground in near-coastal forests and light shrubberies, flowering freely after bush-fires (e.g. Lower Glenelg R., Portland district, Dundas & Black Ranges, Grampians, Hawkesdale, Mts. Cole & Macedon, Brisbane Range, Otways, Queenscliff, Frankston, Dandenongs, Hurst Bridge, Bunyip R., Quail Id in Western Port, Wonthaggi, Wilson Prom., Yarram, Orbost & Cann R. but apparently not in far E. Gippsland); Tas., S.A., W.A.

- Lateral petals *not* longer than sepals, rarely at once erect *and* clavate 2
- 2. Perianth-segments acute or obtuse, their apices *not* produced; labellum \pm distinctly 3-lobed; base of column *without* a pair of sessile glands [Section EUCALADENIA] 11
- Perianth-segments *acuminate* or (more often) their apices produced into long, filiform, glandular tails or clubs; labellum *not* or hardly 3-lobed (except perhaps in *C. dilatata*); inside of the column-base usually with 2 sessile yellow glands [Section CALONEMA] 3
- 3. Labellum much wider than long, the lateral green parts comb-like and furnished with a few long straight teeth (rarely almost or quite entire), the crenate and recurved apical portion deep maroon; lateral sepals *falcate*, produced into long tails that are often crossed and usually terminated by slightly thickened glandular clubs (all segments yellowish-green with red central stripe):

866. *C. dilatata* R. Br. *Prodr. Flor. Nov. Holl.* 325 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1³: t. col. (1877); Erickson, *Orchids of the West* t. 26, col. (1951), as "var. *rhomboidiformis*"; Lee, *Wild Life* 7: 277 (1945); Goldsack, *S. Aust. Nat.* 22³: 4 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 297 ii (1943); Reeves, *Wild Life* 3: 78 (1941); Nicholls in Pescott, *Vict. Nat.* 55: 135 (1938); Nicholls in Barrett, *Sun Nature Book* n. 1: 22 fig. 2, col. (1932), also n. 5: 25 (1934); Ewart, *Flor. Vict.* fig. 159 (1931), also Arnold in Ewart *l.c.* frontisp. fig. 2, col. (1931); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 9, col. (1928), also *Vict. Nat.* 43: t. 6 fig. 9, col. (1926); Dickins, *Vict. Orchids* 6 fig. 12 (1929); Rupp, *Guide Orchids N.S.W.* 134 (1930); Jarman, *Aust. Plant Drawings* 53 (1930); Relf in Pescott, *Native Flowers Vict.* t. opp. 86 (1914); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: t. opp. 42, col. (1911); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 122 fig. b, col. (1858); Charsley, *Wild Flowers Melb.* t. 7 fig. 7, col. (1867), as "*C. pulcherrima*".

Vern.: Green-comb Spider-orchid (Fringed Spider-orchid, Green Spider—W.A.). *Distr.*: Excepting northern plains, grasslands, alps, heavier forests and agricultural land, very widespread in Victoria and often frequent on sandy ground (e.g. in tracts as diverse as Far North-west, Wyperfeld Nat. Park, Little & Big Deserts, Grampians, Lower Glenelg R., St. Arnaud, Bendigo, Gisborne, Brisbane Range, Otways, Arthur's Seat, Mt. Martha, Croydon, Tallarook, Rushworth, Warby Range, Mitta Mitta, Erica, Wilson Prom., Marlo, Mt. Kaye, Wulgulmerang, Howe Range); all States, but in Qd only the extreme south.

[The var. *concinna* H. M. R. Rupp in *Proc. Linn. Soc. N.S.W.* 53: 554, 553 fig. 4 (1928) differs in its dwarf size, shorter *non-caudiform* perianth-segments and very *shortly-toothed* or almost entire lateral margins of labellum; it is recorded only from the Riverina district, N.S.W., and far-northern South Australia, but occasional specimens from northern Victoria closely approach this condition. *C. toxochila*

R. Tate, of South Australia (Yorke & Eyre Peninsulas), is surely close enough to be included under *C. dilatata* var. *concinna* from which it seems to differ only in having slightly clavate, gland-tipped sepals and rather more pronounced denticulations on the two lateral expansions of the labellum—collections (Oct. 1960) of a dwarf plant from the Little Desert near Kiata, Vic., displayed all the salient features of *C. toxochila*. Hybridism between *C. dilatata* and *C. patersonii* is suspected in the Portland area, S.W. Victoria.]

- Labellum *not* wider than long, the lateral parts neither green *nor* conspicuously dilated; lateral sepals not at once falcate *and* produced into tail-like apices 4
- 4. Sepals usually <3 cm. long, simply acuminate (and *without* glandular extensions) *or else* terminated by abruptly thickened clubs of tightly packed, often fused glands 7
- Sepals 3 cm. long or more, tapering into *loosely glandular tails* which are *not* conspicuously differentiated from the lamina; petals usually similar, often less caudiform, rarely devoid of glands at the apex 5
- 5. Labellum about 3-4 mm. wide, ovate, with serrate margins and calli in 2 rows; *no yellow glands* at base of column (flowers yellow, greyish or wholly dark crimson, *very attenuated*, with exceedingly slender, almost capillary segments; leaf <3 mm. wide):

867. *C. filamentosa* R. Br. *Prodr. Flor. Nov. Holl.* 324 (1810).

Illust.: FitzGerald, *Aust. Orchids I*: t. col. (1882); Nicholls, *Aust. Orchid Rev.* 21: 22 (1956); Erickson, *Orchids of the West* t. 28 fig. 2 (1951); Nicholls, *Wild Life* 9: 380 (1947); Scammell in Rupp, *Orchids N.S.W.* t. 9 opp. 60 (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 24 fig. B (1934); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 66 fig. 1 (1914); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 121 fig. B, col. (1858); A. W. D., *Gdnrs' Chron.* ser. 3, 81: 113 (1927).

Vern.: Daddy Long-legs (Tailed Caladenia, Red Spider-orchid—W.A.). *Distr.*: Widespread and sometimes locally rather common in the Mallee, usually on sand-hills, but only very occasional in other parts of western Victoria, rare in East Gippsland and absent from the north-east (Sea Lake, Big & Little Deserts, Dimboola, Grampians, South Portland & Bridgewater where very rare, Maryborough, Coimadai, Anglesea, South Morang, Sandringham where now presumed extinct, Orbost, Cann R.); all States except Qd, and highly variable in W.A.

[The typical form has *uniformly crimson* flowers; but var. *tentaculata* R. S. Rogers in J. M. Black *Flor. S. Aust.*: 138 (1922), although morphologically identical, is *cream-coloured or yellowish* with reddish markings. Both forms occur indiscriminately in western Victoria, where the latter variety is more frequent.]

- Labellum >4 mm. wide, its calli mostly in 4-6 rows; 2 sessile yellow glands always present on the inside of column-base (leaf usually 5 mm. wide or more) 6
- 6. Sepals usually 4-6 cm. long, the tails *loosely pubescent* with a mixture of finger-like (multi-cellular) and rounded glandular hairs; petals usually *similar*; flowers appearing in *spring*, usually yellowish or crimson but the colours variable:

868. *C. patersonii* R. Br. *Prodr. Flor. Nov. Holl.* 324 (1810).

Illustr.: FitzGerald, *Aust. Orchids* 1³: t. col. (1877), also 1⁷: t. col. (1882) as "*C. concolor*"; Fiveash in Rupp, *Aust. Encycl.* 6: 412 c fig. 6, col. (1958); Goldsack, *S. Aust. Nat.* 2³: 2 (June 1944), also Walsh l.c. cover design (June 1944); Garnet, *Wild Life* 5: 331 (1943); Reeves, *Wild Life* 3: 78 (1941), also 1: 20 (Oct. 1938); Nicholls, *Vict. Nat.* 56: 124 fig. A-D (1939), as "*C. arenaria*"; Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. N & Q, col. (1934), the latter as "*C. reticulata*"; Dickins, *Vict. Orchids* 6 fig. 13 (1929); Rupp, *Guide Orchids N.S.W.* 133 (1930); Pescott, *Vict. Nat.* 43: t. 4 fig. 5 (1926); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 34 (1911); Rodway, *Some Wild Flowers Tasm.* t. on 97 (1910); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 123 fig. A, col. (1858); Meredith, *Bush Friends Tasm.* t. 8, col. (1860); Engler & Drude, *Veget. Erde* 7: 141 (1906).

Vern.: Common Spider-orchid. *Distr.*: Excepting drier northern parts, heavy forests, alps, grassland, agricultural country and easternmost Gippsland, widespread through Victoria but most abundant on heaths along the coast (e.g. in localities as dispersed as Lower Glenelg R., Portland district, Cavendish, Grampians, Little Desert, Donald, St. Arnaud, Maryborough, Bendigo, Gisborne, Bannockburn, Otways, eastern Port Phillip Bay where now rare, Dandenongs, Panton Hill, Heathcote & Graytown, Rushworth, Mts. Timbertop & Granya in north-east, Tonimbuk, Moe, Wonthaggi, Wilson Prom., Yarram, Sale district, Marlo); all States, but in Qd only the extreme south (near Stanthorpe).

[A highly polymorphic species with many colour forms. Several varieties have been recognized in Victoria, the most noteworthy being as follows: var. *concolor* (R. D. FitzG., *ut sp.*) J. H. Willis & A. B. Court in *Muelleria* 1: 45 (1956), known from the Grampians, Castlemaine, Heathcote, Anglesea, Port Phillip and Albury regions and distinguished by the uniform prune-purplish colouration of its flowers; var. *magnifica* W. H. Nicholls in *Vict. Nat.* 52: 167, 168 fig. A-C (1936), a robust plant having yellow flowers streaked with vivid crimson (the segments up to 4" long, recalling West Australian var. *longicauda* R. S. Rogers) and at present known only from Clydesdale near Newstead; var. *suaveolens* W. H. Nicholls in *Vict. Nat.* 57: 83 (1940), from Portland district and having brownish-green, exceptionally fragrant flowers.

C. audasii R. S. Rogers in *Trans. roy. Soc. S. Aust.* 51: 295 (1927), described from a single old specimen collected at Mt. McIvor near Heathcote, appears to be no more than a mutant of *C. patersonii*, having the hairs on perianth-segments and calli on labellum both very much reduced.

C. arenaria R. D. FitzG. *Aust. Orchids* 1⁷: +t. col. (1882) shows no significant departure from *C. patersonii*, except in its general greyish flower-colour, and might well be referred to the latter species; it occurs on the western slopes of the central tablelands in New South Wales, and comparable populations have been recorded for South Gippsland—Hedley district, Oct. 1939.

C. variabilis W. H. Nicholls in *Vict. Nat.* 66: 223, 224 fig. L & M (1950), from Wonthaggi (type area), Foster, Yarram and Marlo, would seem to be a hybrid, with *C. patersonii* and *C. tessellata* R. D. FitzG. as parent species—both occurring freely in the same localities. Probable *C. patersonii* × *C. dilatata* hybrids have been noted near Portland, Vic.]

—Sepals usually 3-4 cm. long, the tails densely covered toward apex with rounded glands; petals less caudiform (more acuminate), usually not or only sparsely glandular at apex; flowers appearing in summer, wholly pale yellow-green or pinkish:

869. *C. pallida* Lindl. *Gen. & Spec. orchid. Plant.* 421 (1840).

Illust.: Nicholls, *Vict. Nat.* 58: 179 (1942); Rupp, *Vict. Nat.* 56: 142 (1940).

Vern.: Summer Spider-orchid. *Distr.*: Scattered through the eastern highlands of Victoria, usually on grassy slopes in more open forest and ascending into the alps, but seldom common (Dandenongs, Healesville & Upper Yarra ranges, Upper King R. & Mt. Cobbler, Barry Mtns. & Wonnangatta R. valley, Cravensville on Tallangatta Ck, Limestone Ck & the Cobboras, Mts. Ellery & Drummer, Upper Genoa R.), with a few isolated occurrences in coastal forest at sea-level (Goræ West near Portland, Lorne & Airey's Inlet, Yarram, Marlo); also Tas. (Circular Head, Lake St. Clair, Prosser R. region).

7. Perianth-segments *white*, sometimes marked with pink; sepals rarely clubbed, comparatively short and broadish; labellum ovate, almost *entire*, \pm pinkish on margins and with *pink calli* (short, stoutish plant, very rare and localized near Bannockburn):

870. *C. pumila* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 46: 152 (1922).

Illust.: Nicholls in Barrett, *Sun Nature Book* n. 5: 25 (1934); Nicholls, *Vict. Nat.* 49: 51 (1932); Pescott, *Orchids Vict.* t. opp. 81 (1928), also *Vict. Nat.* 43: t. 17 (1927).

Vern.: Dwarf Spider-orchid (Dwarf Caladenia). *Distr.*: Endemic in Victoria where very rare and known by only two collections from the type locality—"on rushy flats" near Bannockburn (Sept. 1922, Sept. 1926).

—Perianth *never* white with pink markings 8

8. Labellum *narrow-oblong*, lanceolate or ovate, much *longer than wide*; all the sepals usually *strongly clavate* (the petals sometimes clavate also) 10

—Labellum *cordate*, about *as wide as long*, *entire* or almost so; other segments *not* or only slightly clavate 9

9. Margins of labellum *not* thickened, the lamina with 4 rows of *slender, well-separated calli*; other segments *long-acuminate*, the sepals *longer than petals* and usually *minutely clavate*:

871. *C. clavigera* A. Cunn. ex Lindl. *Gen. & Spec. orchid. Plant.* 422 (1840).

C. cordiformis R. S. Rogers in *Trans. roy. Soc. S. Aust.* 44: 330 (1920).

Illust.: Nicholls in Barrett, *Sun Nature Book* n. 5: 25 (1934); Dickins, *Vict. Orchids* 6 fig. 10 (1929); Pescott, *Orchids Vict.* t. opp. 81 (1928), also *Vict. Nat.* 43: t. 17 (1927); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 122, fig. A, col. (1858)—all except the last (Archer & Fitch) as "*C. cordiformis*".

Vern.: Plain-lip Spider-orchid (Clubbed or Small Spider-orchid). *Distr.*: Scattered over southern and central Victoria from the Lower Glenelg R. to Upper Genoa R., on coastal heaths, in lowland forests or on stony slopes in drier open forests of the auriferous belt, but only occasional and often of rare occurrence (e.g. Portland district, Grampians & Black Range, Ararat, Ballarat, Castlemaine & Maldon, Bendigo, Gisborne, Brisbane Range, Torquay & Ocean Grove, Arthur's Seat, Cranbourne, Ringwood & Boronia, near Fernshaw, Wonthaggi, Wilson Prom., Orbost); Tas., S.A. (Kingston & Bordertown), N.S.W. where very rare (a few old records from Yass, Mudgee & Lithgow).

—Margins of labellum *thickened* towards apex, the lamina with 2 or 4 rows of dark, *thickened and very congested* calli; other segments of almost *equal* length, *shortly acuminate, never clavate*:

872. *C. tessellata* R. D. FitzG. *Aust. Orchids* 1²: + t. col. (1876).

C. cardiochila R. Tate in *Trans. roy. Soc. S. Aust.* 9: 60, t. 2 (1887).

Illust.: FitzGerald (*l.c.*); Chidley in Tate (*l.c.*); Goldsack, *S. Aust. Nat.* 22³: 4 (June 1944), as "*C. cardiochila*"; Nicholls in Barrett, *Sun Nature Book* n. 5: 25 & 31 (1934), the former as "*C. cardiochila*"; Nicholls, *Vict. Nat.* 48: 141 (1931); Fiveash in Ewart, *Proc. roy. Soc. Vict. new ser.* 28: t. 22 opp. 222, col. (1916), as "*C. cairnsiana*"; Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 7 (1911), as "*C. cairnsiana*".

Vern.: Thick-lip Spider-orchid (Fleshy-lip Caladenia). *Distr.*: Widespread and locally rather common on damper sandy soils of mallee-heaths and coastal heathlands in southern Victoria, but not near Port Phillip Bay and rare in East Gippsland (Big & Little Deserts, Dimboola, Grampians, Casterton, Lower Glenelg R., Cashmore & Mt. Richmond near Portland where very rare, Otways, Grantville, Wonthaggi, Foster, Wilson Prom., Yarram, Sale district, Marlo); also S.A., N.S.W. (as far north as Hawkesbury R.).

10. Labellum *oblong* to broadly lanceolate, about 3 times as long as wide, *entire* or nearly so, wholly dark purplish, with 4 rows of minute sessile calli toward base; glandular clubs on sepals linear, 3-5 mm. long:

873. *C. leptochila* R. D. FitzG. in *Gdnrs' Chron. new ser.* 17: 462 (1882).

Illust.: FitzGerald, *Aust. Orchids* 2²: t. col. (1885); Goldsack, *S. Aust. Nat.* 22³: 4 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 24 fig. A (1934).

Vern.: Narrow-lip Spider-orchid (Narrow-lip Caladenia). *Distr.*: Very rare in Victoria where known only by a few collections from Ballapur (35 miles N.E. of Stawell), Healesville, Cheltenham (probably now extinct there) and Wilson Prom.; also S.A. (rather widespread, but chiefly in and near the Mt. Lofty Range).

—Labellum *ovate* (sometimes broadly), <3 times as long as wide, normally with conspicuous *marginal and often white-tipped teeth* almost or quite to the apex, varying from almost white to crimson and frequently showing deep reddish-purple veins on the under side, the calli stalked, \pm golfclub-shaped and rarely extending far beyond the bend; clubs on sepals highly variable (from determinate, knob-like and \pm 1 mm. long to indefinite, linear and 10-20 mm. long):

874. *C. reticulata* R. D. FitzG. in *Gdnrs' Chron. new ser.* 17: 462 (1882).

Illust.: FitzGerald, *Aust. Orchids* 2²: t. col. (1885), also 1²: t. col. (1876) as "*C. clavigera*"; Goldsack, *S. Aust. Nat.* 22: 4 (1944); Garnet, *Wild Life* 5: 331 (1943); Nicholls, *Vict. Nat.* 58: 116 fig. F-J (1941), as "*C. patersonii* var. *hastata*"; Nicholls, *Sun Nature Book* n. 5: 25 & 26 (1934), the former as "*C. clavigera*".

Vern.: Veined Spider-orchid (Veined Caladenia). *Distr.*: Widespread through south-western, central and eastern Victoria, sometimes frequent on coastal heaths but of more occasional, scattered occurrence in woodland or forests of the highlands, and rare in the southern Mallee (e.g. localities as dispersed as Lower Glenelg R., Portland, Grampians, Little Desert, Ararat, Donald, St.

Arnaud, Creswick, Otways, Dandenongs, Hurst Bridge, Mt. Timbertop, Frankston-Cranbourne region, Wonthaggi, Wilson Prom., Nowa Nowa, Orbost, Combiensbar, Cann R., Genoa R., Cape Howe, Suggan Buggan); Tas., S.A., N.S.W., Qd (Wallangarra in extreme south).

[*C. reticulata* is an unfortunate name, because the labellum is *striped* rather than "netted" with purplish veins. As recognized in this key, it covers a polymorphic assemblage from which two variants have been accorded specific rank within recent years, viz.: *C. fitzgeraldii* H. M. R. Rupp in *Vict. Nat.* 58: 199 (1942)—figured by FitzGerald in 1876 as "*C. clavigera*" (l.c.), but certainly not that species and only differing from his subsequent *C. reticulata* in the rather trifling characters of a less toothed (or even entire) labellum-tip, as well as absence of deeply pigmented veins and flecks on the labellum-lamina and column respectively; also *C. hastata* (W. H. Nicholls, ut *C. patersonii* var.) H. M. R. Rupp in *Vict. Nat.* 58: 198 (1942)—a population in the Portland district having longer (10-20 mm.) blackish clubs on the sepals, sometimes with clavate petals also, and a usually paler labellum with marginal calli extending nearer to the base than in typical South Australian *C. reticulata*. Another form from Warrnambool district is stockier (always less than 4" high), the relatively short sepals and petals all bearing conspicuous broad clubs 5-10 mm. long. Yet another robust variant from French Id is up to 18" tall, with sepaline clubs 10-20 mm. in length and a dark labellum 10-15 mm. wide. Puzzling intermediate states exist between the extremes assumed by this species, which is no more variable than either *C. patersonii* or *C. carnea*, and any attempt to give names to the various local forms or mutations within the complex is deemed inadvisable at present.]

11. Dorsal sepal *strongly inarched*, forming a concave hood over the column; flowers bronzy or varying from white to pink (rarely pale purple) 17
—All the sepals similar, the dorsal one *spreading* or slightly arched, but *never* forming a hood over the column; flowers blue, white or pink 12
12. Labellum very *obscurely 3-lobed*, sessile, *erect* with only the fringed apical part recurved; laminal calli *pubescent*, *crowded* in 4-6 rows, giving labellum a very hirsute appearance; whole flower typically *dark blue* (leaf erect, broad-linear to lanceolate):

875. *C. deformis* R. Br. *Prodr. Flor. Nov. Holl.* 324 (1810).

Illust.: FitzGerald, *Aust. Orchids* 15: t. col. (1879); Erickson, *Orchids of the West* t. 29 fig. 28 (1951); Goldsack, *S. Aust. Nat.* 22³: 4 (1944); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 7 (1940); Nicholls in Barrett, *Sun Nature Book* n. 1: 22 fig. 1, col. (1932), also n. 5: 24 (1934); Nicholls, *Vict. Nat.* 47: t. 4 fig. 21 (1931); Jarman, *Aust. Plant Drawings* 82 A (1930); Pelloe, *W. Aust. Orchids* frontisp. fig. 12, col. (1930); Dickins, *Vict. Orchids* 4 fig. 8 (1929); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 28 (1911); Rodway, *Some Wild Flowers Tasm.* t. on 96 (1910); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 123 fig. B, col. (1858), as "*C. barbata*"; Meredith, *Bush Friends Tasm.* t. 8, col. (1860), as "*Calendia barbata*".

Vern.: Bluebeard Caladenia (Blue Fairies). *Distr.*: Widespread and locally abundant through southern and central Victoria, from coastal heathland to drier box forests of the auriferous belt (e.g. Lower Glenelg R., Portland district, Grampians, Little Desert, Dimboola, Bolangum, St. Arnaud, Wedderburn, Inglewood, Bendigo, Maryborough, Maldon & Castlemaine, Mt. Macedon, Gisborne, Melton, Brisbane Range, Otways, eastern Port Phillip Bay where now rare, Ringwood-Bayswater, Grantville, Wonthaggi, Wilson Prom..

Orbost & Mt. Raymond, Marlo, Genoa R., Mallacoota), with an isolated record for Cornishtown in the north-east; all States except Qd, but localized and rare in N.S.W. (Como & Molong).

[A probable intergeneric hybrid, *C. tutelata* R. S. Rogers, between *C. deformis* and *Glossodia major* is discussed under the latter species (q.v., No. 887).]

—Labellum *distinctly 3-lobed*, bearing 2-4 rows of *pale* (white, yellow or pink) *glabrous* calli; if flowers ever blue, then leaf \pm prostrate and mid-lobe of labellum entire 13

13. Leaf lanceolate, > 5 mm. wide; lateral lobes of labellum barred with pink, the central lobe with a few *long lateral teeth* and a *pink central blotch*; calli rather irregularly arranged in 2 converging rows, spreading \pm *digitately* (coastal plant):

876. *C. latifolia* R. Br. *Prodr. Flor. Nov. Holl.* 324 (1810).

Illust.: FitzGerald, *Aust. Orchids* 25: t. col. (1893); Erickson, *Orchids of the West* t. 29 fig. 35 (1951); Galbraith, *Wildflowers Vict.* t. 24 (1950); Goldsack, *S. Aust. Nat.* 223: 4 (June 1944), also 15: 63 (1934); Lee, *Wild Life* 9: 326 (1947); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 13 (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 24 (1934); Pelloe, *W. Aust. Orchids* frontisp. fig. 8, col. (1930); Nicholls, *Vict. Nat.* 47: 160 fig. 11 (1931); Ewart, White & Wood, *Proc. roy. Soc. Vict.* new ser. 23: t. 52 (1911).

Vern.: Pink Fairies. *Dist.*: Scattered through southern Victoria on light coastal or near-coastal sands, often in the shade of tea-tree thickets and locally abundant (Lower Glenelg R., Nelson, Casterton, Portland district, Grampians, Otways, Point Lonsdale, Arthur's Seat & Rye, eastern shores of Port Phillip where now rare, Wilson Prom., Sale district, Marlo, Cape Howe); Tas., S.A., W.A. (frequent), ?N.S.W. (extreme south).

—Leaf slender, < 5 mm. wide; labellum *not* pink toward apex; calli in \pm *regular longitudinal rows* 14

14. Mid-lobe of labellum manifestly *longer than* the rather *narrow* lateral lobes, fringed with finger-like teeth and tipped with a *deep orange* coloration; labellum-lamina and column either unmarked or irregularly blotched with red (perianth-segments 12-20 mm. long, *white* or rarely *pale pink*):

877. *C. alba* R. Br. *Prodr. Flor. Nov. Holl.* 323 (1810).

Illust.: Smith in *Curtis's bot. Mag.* 124: t. 7630 fig. A, col. (1898), as "*C. carnea* var. *alba*"; FitzGerald, *Aust. Orchids* 17: t. col. (1882); Scammell in Rupp, *Orchids N.S.W.* t. 10 opp. 64 (1943); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 6 (1940); Rupp, *Guide Orchids N.S.W.* 141 (1930); Nicholls in Barrett, *Sun Nature Book* n. 5: 26 (1934); Nicholls, *Vict. Nat.* 47: 160 fig. 6 (1931); Fish in *Garden, Lond.* 63: 99 (1903), as "*C. carnea* var."

Vern.: White Caladenia. *Dist.*: Confined in Victoria to forested hills of the south-east, but of scattered occurrence and uncommon to rare (Ringwood & Dandenongs, Mt. Erica, Combienbar, Upper Genoa R.); also N.S.W., Qd (far south-east).

[The var. *picta* W. H. Nicholls in *Vict. Nat.* 47: 157, 160 fig. 7 (1931) differs in having a *tricoloured column*—olive-green, deep red and white; it is recorded from Ringwood, Vic., and several coastal districts in New South Wales.]

—Mid-lobe of labellum *shorter* and *smaller* than the very broad \pm rounded lateral lobes; labellum-lamina and column unmarked or with fine transverse bars of colour (red or dark blue) 15

15. Perianth-segments *acute*, 7-10 mm. long; labellum *unmarked*, the mid-lobe bordered with a few broad, truncated orange teeth, the apex *deep orange*; column unmarked (flowers *always white*):

878. *C. aurantiaca* (R. S. Rogers) H. M. R. Rupp in *Proc. Linn. Soc. N.S.W.* 71: 280 (1947).

C. carnea R. Br. var. *aurantiaca* R. S. Rogers in
Trans. roy. Soc. S. Aust. 46: 154 (1922).

Illust.: Nicholls, *Vict. Nat.* 47: 160 fig. 5 (1931), as "*C. carnea* var. *aurantiaca*".

Vern.: Orange-tip Caladenia. *Dist.*: Restricted in Victoria to damp coastal and near-coastal heaths of Gippsland, but rather frequent in the few localities where observed (near Yallourn, Alberton & Port Albert, Marlo, Reedy Ck near Cann R., Genoa); also N.S.W. (coastal districts).

—Perianth segments *bluntish*; labellum finely and *transversely barred* (except in "albino" specimens), the mid-lobe not bordered with broad and truncate teeth 16

16. Leaf linear, \pm *erect*; flowers *pink* or almost white, the segments dusky-greenish externally (from minute glandular hairs); labellum barred with *dark red*, the mid-lobe with small *finger-like lateral teeth*:

879. *C. carnea* R. Br. *Prodr. Flor. Nov. Holl.* 324 (1810).

Illust.: FitzGerald, *Aust. Orchids* 17: t. col. (1882); Forster in Harris, *Wild Flowers Aust.* t. 17, col. (1947); Goldsack, *S. Aust. Nat.* 22³: 4 (June 1944); Rupp, *Aust. Orchid Rev.* 5: fig. 2 & 14 (1940), the latter as "var. *pygmaea*"; Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. D, col. (1934), as "var. *gigantea*"; Nicholls, *Vict. Nat.* 47: 160 fig. 1-3 (1931) as "var. *gigantea*", fig. 4 (1931) as "var. *pygmaea*"; Ewart, *Flor. Vict.* fig. 160 (1931); Rodway, *Some Wild Flowers Tasm.* t. on 100 (1910); Charsley, *Wild Flowers Melb.* t. 7 fig. 5, col. (1867), as "*C. alata*"; Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 124 fig. A, col. (1858); Hatch, *Trans. roy. Soc. N.Z.* 77: 400 fig. D-F (1949), as varieties "*minor*, *exigua* and *bartlettii*" respect.; Bauer in Endlicher, *Icon. Gen. Plant.* t. 51 (1838).

Vern.: Pink Fingers. *Dist.*: Except for the Far North-west, northern plains, alps, heavy forest, grassland and agricultural terrain, a very widespread frequent orchid in Victoria—from coastal heaths through lighter highland forests to the Mallee (Little & Big Deserts), goldfield areas and Upper Murray R.; all States except W.A., also N.Z. & N. Cal.

[The species is variable in size and colouration, and the four following varieties have been recognized in Victoria: var. *pygmaea* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 51: 13 (1927), a diminutive plant of damp heathland near the coast (e.g. Portland, Anglesea, Sandringham, Marlo and Mallacoota Inlet), having *very small* (5-8 mm. long) but comparatively broad perianth-segments; var. *gigantea* R. S. Rogers (*l.c.*), a robust population to almost 2 ft. high with *large brightly-pigmented* flowers (sepals up to 2 cm. long and often more than 5 mm. wide), recorded from Cann River in East Gippsland; var. *ornata* W. H. Nicholls in *Vict. Nat.* 62: 61, 63 fig. G-J (1945), having the whole upper surface of labellum ornamented with *broad* transverse crimson striae, and known only from Goræ near

Portland (Oct. 1943); var. *subulata* W. H. Nicholls *l.c.* 61, 63 fig. A-F (1945), also from Portland district (Oct. 1943), distinguished by its yellow, *entire and subulate* mid-lobe to the labellum and its pale flowers.]

—Leaf oblong, to linear-lanceolate, \pm *prostrate*; flowers normally *pale to bright blue* (rarely white); labellum barred with *dark blue*, its mid-lobe *entire*:

880. *C. cærulea* R. Br. *Prodr. Flor. Nov. Holl.* 324 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1st: t. col. (1879); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 10 (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 24 (1934); Nicholls, *Vict. Nat.* 47: t. 4 fig. 20 (1931); Rupp, *Guide Orchids N.S.W.* 142 (1930).

Vern.: Blue Caladenia. *Distr.*: Widespread and often abundant through the gold-fields of western Victoria, favouring stony ground in drier Box-Ironbark forests (e.g. Grampians, Stawell, Ararat, St. Arnaud & Bealiba, Maryborough, Bendigo, Gisborne, Werribee Gorge & Brisbane Range), more scattered on similar terrain in the east and extending to coastal heaths of East Gippsland, but not in heavy mountain-forests (Eltham & Warrandyte districts, Seymour, Longwood, Rushworth, Warby Range, Mt. Timbertop, Upper Murray R., Sale district, Orbost, Cann R., Mt. Kaye, Genoa, Mallacoota & Howe Range); S.A. (Bugle Ranges), N.S.W., Qd.

17. Mid-lobe of labellum *long-acuminate, entire*, completely covered by 2 rows of *tightly packed reddish-black calli* (flowers bright pink with narrow, lanceolate segments up to 2 cm. long):

881. *C. congesta* R. Br. *Prodr. Flor. Nov. Holl.* 324 (1810).

Illust.: FitzGerald, *Aust. Orchids* 2nd: t. col. (1894); Clark, *Wild Life* 1: 359 (1945); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 5 (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. 1, col. (1934); Nicholls, *Vict. Nat.* 47: 60 fig. 13 (1931); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 6, col. (1928), also *Vict. Nat.* 43: t. 6 fig. 6, col. (1926); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 124 fig. B, col. (1858).

Vern.: Black-tongue Caladenia. *Distr.*: Excepting the Mallee, northern plains, alps, grasslands and agricultural tracts, scattered through Victoria from coastal heaths to montane forests, but seldom common and often only occasional (Portland district, Grampians, St. Arnaud, Carnham, Macedon & Gisborne districts, Airey's Inlet, Kinglake, Healesville, Bayswater & Dandenongs, Arthur's Seat, Quail Id, Grantville, Waratah Bay, Wilson Prom., Maffra, Combienbar, Bonang & Bendoc, Wulgulmerang, Cravensville on Tallangatta Ck, Mt. Timbertop near Mansfield); Tas. (chiefly northern), S.A. (near Mt. Gambier), N.S.W. (tablelands and rare).

—Mid-lobe of labellum *denticulate, not long-acuminate*, the calli usually in 4-6 rows

18. Leaf > 5 mm. wide, sparsely hirsute or almost glabrous; perianth-segments *broad* (the dorsal sepal usually 4 mm. wide or more), often *rosy-red* externally and white on the inner surfaces; labellum *conspicuously barred* with red or purplish striae, its margin shortly serrate; calli of lamina yellow or whitish, in 4 rows; column widely winged, dotted or streaked with red (alpine or subalpine plant):

882. *C. lyallii* Hook. f. *Flor. N.-Z.* 1: 247 (1853).

C. alpina R. S. Rogers in *Trans. roy. Soc. S. Aust.* 51: 12 (1927).

Illust.: Rupp, *Aust. Orchid Rev.* 5: 84 fig. 1 (1940), as "*C. alpina*"; Nicholls in Barrett, *Sun Nature Book*, n. 1: 22 fig. 11, col. (1932), also n. 5: 25 (1934)—both as "*C. alpina*"; Nicholls, *Vict. Nat.* 47: 160 fig. 10 (1931), as "*C. alpina*"; Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 125 fig. B, col. (1858), as "*C. angustata*"; Hatch, *Trans. roy. Soc. N.Z.* 77: 400 fig. A-C (1949); Dalrymple, *Orchid Hunting in Otago, N.Z.* t. col. on 20 (1937).

Vern.: Mountain Caladenia. *Distr.*: In Victoria restricted to higher montane forest, subalpine woodland and alpine tussock-grassland, seldom below 3500 ft. alt. and often locally common, but apparently not in East Gippsland (Mt. Donna Buang, Lake Mtn., Matlock, Baw Baws, Mts. Wellington, Skene, Howitt, Cobbler, Stirling, Feathertop & Hotham, Bogong High Plains, Cobungra, with an isolated western occurrence in the Grampians); Tas., N.S.W. (south-eastern alps), N.Z.

—Leaf narrow-linear, <5 mm. wide; dorsal sepal usually <4 mm. wide 19

19. Column and dorsal sepal both conspicuously bent forward; surface of labellum minutely scabrous-denticulate, the almost entire lateral lobes usually pink-spotted, the mid-lobe (including marginal teeth) dark purplish; calli and marginal teeth of labellum-tip minutely scabrous-denticulate, \pm finger-like:

883. *C. cucullata* R. D. FitzG. *Aust. Orchids* 1²: + t col. (1876).

Illust.: FitzGerald (l.c.); Forster in Harris, *Wild Flowers Aust.* t. 66, col. (1947); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 4 (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 25 (1934); Nicholls, *Vict. Nat.* 47: 160 fig. 8 (1931).

Vern.: Hooded Caladenia. *Distr.*: Scattered through lighter, drier forests of western Victoria, but neither in the Mallee proper nor Far South-west, usually on poor sandy or stony ground and sometimes rather common in auriferous country (Little Desert, Balmoral, Black Range & Grampians, Ararat, St. Arnaud, Mt. Korong, Neilborough, Bendigo, Maryborough, Mt. Beckworth & Creswick, Brisbane Range, Graytown & Rushworth), with an isolated north-eastern occurrence at Beechworth; also N.S.W., Tas. (chiefly northern).

—Column not conspicuously bent forward; calli and marginal teeth of labellum smooth or \pm granular, but not scabrous-denticulate 20

20. Labellum pale (white, pink or yellowish, rarely darker), the surfaces minutely scabrous-denticulate; marginal teeth and laminal calli grape-like, sessile or almost so but not congested; flowers with strong musky fragrance (rarely odourless):

884. *C. angustata* Lindl. *Gen. & Spec. orchid. Plant.* 420 (1840).

C. præcox W. H. Nicholls in *Vict. Nat.* 43: 156, 157 fig. a-j (1926);

C. testacea sens. Ewart *Flor. Vict.* 351 (1931), non R. Br. (1810).

Illust.: Nicholls (l.c.); Galbraith, *Wildflowers, Vict.* ed. 2: t. 21 A (1955); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 9 (1940); Nicholls, *Vict. Nat.* 55: 166 fig. A, D, E (1939) as "*C. testacea* var. *præcox*", also 47: 160 fig. 9 & t. 4 fig. 16 (1931), the latter as "*C. præcox*"; Nicholls in Barrett, *Sun Nature Book* n. 5: 24 & 26

(1934), the latter as "*C. præcox*"; Dickins in Pescott, *Native Flowers Vict.* t. opp. 96 fig. 6, col. (1914), as "*C. carnea*"; Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 125 fig. A, col. (1858), as "*C. alata*".

Vern.: Musky Caladenia (Slender Caladenia). *Distr.*: Excepting the Mallee, northern plains, grasslands and agricultural terrain, very widespread almost throughout Victoria, from sea-level to subalpine heights, and often abundant on lightly forested slopes; S.A., Tas., N.S.W.

[In *Vict. Nat.* 55: 168 (1939), Nicholls reduced his own *C. præcox* (l.c.) to a pale, early-flowering variety of *C. testacea* R. Br., but H. M. R. Rupp continued to regard it as a distinct species. It is at least as close to *C. angustata*, with which included in the present key, and it may eventually prove to have even closer affinities with *C. dimorpha* R. D. FitzG. of New South Wales.]

—Labellum with *smooth surfaces*, the mid-lobe *dark purplish*; flowers *not* musk-scented, with *greenish, golden or rufous tints* inside 21

21. Labellum-margins *fringed* with finger-like teeth, the lateral lobes *almost obsolete* and mid-lobe *purplish-red with paler margins*; calli hardly congested:

885. *C. testacea* R. Br. *Prodr. Flor. Nov. Holl.* 324 (1810).

C. hildæ E. E. Pescott & W. H. Nicholls in *Vict. Nat.* 45: 235, 236 fig. a-j (1929).

Illust.: Nicholls (l.c.); FitzGerald, *Aust. Orchids* 1²: t. col. (1876); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 8 (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 26 (1934), as "*C. hildæ*"; Nicholls, *Vict. Nat.* 55: 166 fig. B & G (1939), also 47: t. 4 fig. 14 (1931); Rupp, *Guide Orchids N.S.W.* 138 (1930).

Vern.: Honey Caladenia (Golden Caladenia). *Distr.*: Scattered in widely separated parts of eastern Victoria where uncommon, from the coast to sub-alps but precise range not known owing to former confusion with *C. angustata*—noted at Cobungra (type locality of *C. hildæ*), Wulgulmerang, Bonang and Mallacoota, with an isolated northerly record for Rushworth district; also N.S.W. (as far north as Bulladelah and chiefly coastal).

—Labellum-margins *entire* below (except for 2-3 blunt teeth at widest part), the lateral lobes *acute* and transversely *barred with red*, the mid-lobe wholly *purplish-black*; calli *tightly packed* in 2-4 rows and also fringing the mid-lobe:

886. *C. iridescens* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 44: 328, t. 13 (1920).

Illust.: Fiveash in Rogers (l.c.); Rupp, *Aust. Orchid Rev.* 5: 84 fig. 15 (1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 25 (1934); Nicholls, *Vict. Nat.* 47: 160 fig. 12 (1931); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 7, col. (1928), also *Vict. Nat.* 43: t. 6 fig. 7, col. (1926).

Vern.: Bronze Caladenia. *Distr.*: Occasional on sandy ground in the lighter forests of western Victoria (Cavendish, Black Range & Grampians, Ararat, Kyneton, Airey's Inlet), also Croydon and Healesville districts; Tas. (Circular Head in Far North-west), N.S.W. (rare—Yass, Blue Mtns., Narrabeen, Wyong).

276. GLOSSODIA R. Br. (1810)

Sepals and petals 1.5-3 cm. long, pale to bright purplish (rarely white); labellum 7-11 mm. long, the apical part *purple* and base *white*; the 2 *yellow* calli at labellum-base *fused*, forming a bilobed and widely V-shaped gland:

887. *G. major* R. Br. *Prodr. Flor. Nov. Holl.* 326 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1⁴: t. col. (1878); Galbraith, *Wildflowers Vict.* ed. 2: t. 21 b (1955); Garnet, *Wild Life* 5: 331 (1943); Goldsack, *S. Aust. Nat.* 22³: 4 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 297 iii (1943); Nicholls in Barrett, *Sun Nature Book* n. 1: 23 fig. 7, col. (1932), also n. 5: 31 (1934); Arnold in Ewart, *Flor. Vict.* frontisp. fig. 4, col. (1931), also Ewart *l.c.* fig. 158 (1931); Dickins, *Vict. Orchids* 24 fig. 41 (1929); Pescott, *Orchids Vict.* t. opp. 64 (1928); Mort in Sulman, *Wildflowers N.S.W.* t. 65 fig. 2 (1914); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 31 (1911); Rodway, *Some Wild Flowers Tasm.* t. on 103 (1910); Charsley, *Wild Flowers Melb.* t. 7 fig. 4, col. (1867); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 120 fig. b, col. (1858); Meredith, *Bush Friends Tasm.* t. 8, col. (1860); Bauer in Endlicher, *Icon. Gen. Plant.* t. 41 (1838).

Vern.: Wax-lip Orchid (Parson-in-the-pulpit). *Distr.*: Excepting the Mallee proper, northern plains, alps, heavier forest, grassland, agricultural tracts and settlements, very widespread through Victoria and often so abundant in sandy open forest as to form sheets of colour during springtime (e.g. such representative areas as Lower Glenelg R., Grampians, Little Desert, western goldfields, Otways, Brisbane Range, eastern Port Phillip, Graytown & Rushworth, Warby Range, Ovens R., Mitta Mitta, Cravensville, Wilson Prom., Rosedale, Mt. Kaye, Genoa R.); all States except W.A., but in Qd only the south-east.

[*Caladenia tutelata* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 31: 211 (1907), from Black Hill and Blackwood (S.A.), superficially resembles *Glossodia major* with which it is associated in the field, but has 4 long "sentinel" calli at the labellum-base and 2 irregular rows of coloured golfclub-like calli along the lamina. It probably constitutes a natural hybrid between *Glossodia major* and *Caladenia deformis*, as suggested by Rogers (*l.c.*), having been noted also in Casterton district and at Point Lonsdale (Vic.), apparently near Bulladelah and the Barrington Tops (N.S.W.). Line drawings by Nicholls may be found in *Vict. Nat.* 47: t. 4 fig. 19 (1931) and in *Sun Nature Book* n. 5: 26 (1934).]

Sepals and petals <1.5 cm. long, deep violet-blue (rarely white); labellum 3-5 mm. long, *not* distinctly part purple and part white; the 2 calli at labellum-base *linear, separate* (or connate only at their very base) and usually *black-tipped*:

888. *G. minor* R. Br. *Prodr. Flor. Nov. Holl.* 326 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1⁴: t. col. (1878); Scammell in Rupp, *Orchids N.S.W.* t. 11 opp. 70 (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 31 (1934); Rupp, *Guide Orchids N.S.W.* 145 (1930).

Vern.: Small Wax-lip Orchid. *Distr.*: Restricted in Victoria to East Gippsland, but there ranging throughout the coastal "grass-tree plains" (heathland) from Marlo eastward to the New South Wales border, and often abundant (e.g. Newton's Ck, Cann R. & Reedy Ck, Genoa); N.S.W., Qd (south-east only).

277. *CORYBAS* Salisb. (1805)

1. Margins of labellum entire; either the labellum spurred or dorsal sepal sharply contracted into a claw (leaf reddish beneath; flower very dark, strongly galeate) 4

—Margins of labellum fimbriate or serrulate; neither the labellum spurred nor dorsal sepal sharply contracted behind 2

2. Labellum fringed with *long dark fimbriæ*, its lamina longer than tube and central boss obscure (flower dark reddish-purple, often 1-2 cm. wide):

889. *C. fimbriatus* (R. Br.) Reichenb. f. *Beitr. syst. Pflk.* 42 (1871).

Corysanthes fimbriata R. Br. *Prodr. Flor. Nov. Holl.* 328 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1¹: t. col. (1875); Garnet, *Wild Life* 3: 192 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 20 (1934); Dickins, *Vict. Orchids* 10 fig. 54 (1929); Nicholls, *Proc. Linn. Soc. N.S.W.* 53: t. 12 ser. 1 (1928); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 12, col. (1928), also *Vict. Nat.* 43: t. 6 fig. 12, col. (1926)—all except the last (1926) as "*Corysanthes fimbriatus*".

Vern.: Fringed Helmet-orchid. *Distr.*: Confined in Victoria to the east, on moist, shaded, sandy ground not far from the coast where sometimes abundant (Hedley near Foster, Wilson Prom., Bairnsdale, Marlo, Genoa), an isolated inland record from the Ovens R. being open to question; Tas. (eastern), N.S.W., Qd (apparently only Tamborine Mtn.).

—Labellum serrulate on margins, its lamina no longer than tube (flower seldom 1.5 cm. wide) 3

3. Labellum (and dorsal sepal) dull grey-purplish, with *incurved* minutely toothed margins and a large, pale, conspicuous central boss; ovary *short and broad*:

890. *C. diemenicus* (Lindl.) H. M. R. Rupp in *Proc. Linn. Soc. N.S.W.* 53: 551 (1928).

Corysanthes diemenica Lindl. *Gen. & Spec. orchid. Plant.* 393 (1840).

Illust.: Garnet, *Wild Life* 3: 192 (1941); Nicholls in Barrett, *Sun Nature Book* n. 5: 20 (1934); Ewart, *Flor. Vict.* fig. 154 (1931); Nicholls, *Proc. Linn. Soc. N.S.W.* 53: t. 12 ser. 2 (1928); Rodway, *Some Wild Flowers Tasm.* t. on 114 (1910)—all as "*Corysanthes diemenica*".

Vern.: Slaty Helmet-orchid (Purple Helmet-orchid). *Distr.*: Widespread through western, southern and eastern Victoria, usually in damp, shaded, sandy places and often abundant on coastal heaths (e.g. Lower Glenelg R., Portland district, Dundas Range, Grampians, Little Desert, Brisbane Range, Otways, Point Lonsdale, Frankston, Beaumaris, Dandenongs, Hurst Bridge, Yarram, Sale, Bairnsdale, Lakes Entrance, Genoa R., Suggan Buggan, Cravensville, Cudgewa & Upper Murray R.); Tas., S.A. (Mt. Lofty Range), N.S.W. (near Mudgee and very rare).

—Labellum reddish, with straight or spreading *coarsely toothed* margins, prominent red veining and an ill-defined central boss; ovary *long and slender*:

891. *C. dilatatus* (H. M. R. Rupp & W. H. Nicholls) H. M. R. Rupp in *Proc. Linn. Soc. N.S.W.* 53: 551 (1928).

Corysanthes dilatata H. M. R. Rupp & W. H. Nicholls in *l.c.* 35: 87, t. 12 ser. 4 & ser. 5 fig. 1 (1928).

Illust.: Nicholls (*l.c.*); Erickson, *Orchids of the West* 71 (1951); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 299 ii (1943); Nicholls, *Wild Life* 3: 210 (1941), also Garnet *l.c.* 3: 192 (1941)—both as "*Corysanthes dilatata*"; Nicholls in Barrett,

Sun-Nature Book n. 1: 22 fig. 20, col. (1932), also n. 5: 21 (1934)—both as "*Corysanthes dilatata*"; Dickins, *Vict. Orchids* 10 fig. 53 (1929), as "*Corysanthes pruinosa*"; Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 21 (1911), as "*Corysanthes pruinosa*"; Rodway, *Some Wild Flowers Tasm.* t. on 114 (1910), as "*Corysanthes pruinosa*"; Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 107 fig. B, col. (1858), as "*Corysanthes fimbriata*".

Vern.: Veined Helmet-orchid (Toothed Helmet-orchid). **Distr.:** Widespread in cool shaded places of western and southern Victoria, often forming extensive colonies under coastal shrubs, in moist rocky defiles or on tree-fern trunks in mountain fern gullies (e.g. Lower Glenelg R., Portland district, Creswick, Werribee Gorge, Brisbane Range, Frankston, Panton Hill, Dandenongs, Healesville, Waratah Bay, Wilson Prom., Yarram, Marlo where very rare), with an isolated northern occurrence in Warby Range; Tas., S.A., W.A. (Karri forest region).

4. Dorsal sepal longer than labellum and concealing it, usually <1 cm. long, falcately tapering to a *pointed apex*; labellum with 2 prominent deflexed *spurs at base*:

892. *C. aconitiflorus* Salisb. *Parad. Lond.* t. 83 (1805).

Corysanthes bicalcarata R. Br. *Prodr. Flor. Nov. Holl.* 328 (1810).

Illust.: Salisbury (l.c.); FitzGerald, *Aust. Orchids* 1²: t. col. (1876), as "*Corysanthes bicalcarata*"; Forster in Harris, *Wild Flowers Aust.* t. 51, col. (1947); Clark, *Wild Life* 8: 71 (1946); Garnet, *Wild Life* 3: 191 (1941), as "*Corysanthes bicalcarata*"; Nicholls in Barrett, *Sun Nature Book* n. 1: 23 fig. 22, col. (1932), and n. 5: 27 fig. R, col. (1934)—both as "*Corysanthes aconitiflorus*"; Coleman, *Vict. Nat.* 48: 95 & 97 (1931), as "*Corysanthes bicalcarata*"; Nicholls, *Proc. Linn. Soc. N.S.W.* 53: t. 12 ser. 6 fig. 4-9 (1928), as "*Corysanthes bicalcarata*"; Rupp, *Guide Orchids N.S.W.* 95 (1930), as "*Corysanthes bicalcarata*"; Rodway, *Some Wild Flowers Tasm.* t. on 114 (1910), as "*Corysanthes bicalcarata*"; Hatch, *Trans. roy. Soc. N.Z.* 76: t. 58 fig. 1 A-D (1947).

Vern.: Spurred Helmet-orchid. **Distr.:** Localized and rare in Victoria where known only from Healesville, Tonimbuk near Gembrook, Newmerella near Orbost and Marlo, usually on damp sandy ground well shaded by ferns or bushes; Tas. (Bridport and near George's Bay), N.S.W., Qd (as far north as Atherton tableland), also N.Z.

—Dorsal sepal shorter than labellum, <1 cm. long, very broad and *blunt at apex* but suddenly contracting behind into a *narrow claw* to 7 mm. long; labellum without spurs, but bearing a line of numerous calli from base to lip of orifice (the small pedicellate flower resembling a duck's head in profile):

893. *C. unguiculatus* (R. Br.) Reichenb. f. *Beitr. syst. Pflk.* 43 (1871).

Corysanthes unguiculata R. Br. *Prodr. Flor. Nov. Holl.* 328 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1²: t. col. (1876); Garnet, *Wild Life* 3: 192 (1941); Nichols in Barrett, *Sun Nature Book* n. 5: 21 (1934); Nicholls, *Proc. Linn. Soc. N.S.W.* 53: t. 12 ser. 6 fig. 1-3 (1928); Nicholls in Pescott, *Orchids Vict.* frontisp. fig. 11, col. (1928), also *Vict. Nat.* 43: t. 6 fig. 11, col. (1926); Rodway, *Some Wild Flowers Tasm.* t. on 114 (1910); Hatch, *Trans. roy. Soc. N.Z.* 76: t. 58 fig. 2 E-J (1947); Reichenbach f., *Xenia Orchidacea* 2: t. 197 fig. VI-VII & 2-4 (1874); Bauer in Endlicher, *Icon. Gen. Plant.* t. 18 (1838)—all except the last, Nicholls (1926) and Hatch (1947), as "*Corysanthes unguiculata*".

Vern.: Small Helmet-orchid (Pelicans—at Hedley, Vict.). *Distr.*: Scattered on sandy heaths of southern Victoria, usually amongst humus in the shade of coastal or near-coastal shrubberies and sometimes locally frequent (Lower Glenelg R., Portland district, Grampians, Otways, eastern shores of Port Phillip Bay where now probably extinct, Langwarrin, South Belgrave, Healesville, Hedley & Yarram, Marlo but apparently not elsewhere in East Gippsland); S.A. (far south-east), Tas., N.S.W. (as far north as Woy Woy), N.Z. (North Id and rare).

278. *CRYPTOSTYLIS* R. Br. (1810)

1. Plant *leafless* at flowering time; labellum straight, narrow-oblong (2-3.5 cm. long), dark dull red, conspicuously and *densely pubescent* over the upper two-thirds, without terminal boss:

894. *C. hunteriana* W. H. Nicholls in *Vict. Nat.* 54: 182, t. 18 (1938).

Illust.: Nicholls (*l.c.*); Dockrill, *Aust. Orchid Rev.* 20: 74 (1955); Wakefield, *Wild Life* 2: 30 (June 1940).

Vern.: Leafless Tongue-orchid. *Distr.*: Confined in Victoria to near-coastal East Gippsland where scattered on damp heathland of the "grass-tree plains" and uncommon (Marlo, Cape Conran, Bellbird, Cabbage-tree Ck & McKenzie R., Reedy & Bottle Cks near Cann R.); also N.S.W. (Broken Bay north of Sydney).

—Plant bearing 1-3 large ovate to lanceolate leaves at base of flowering scape; labellum *glabrous* or only very minutely pubescent 2

2. Labellum very concave and *dilated* (1-2 cm. wide), forming a hood over the flower, conspicuously and \pm *reticulately veined* with dark lines:

895. *C. erecta* R. Br. *Prodr. Flor. Nov. Holl.* 317 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1³: t. col. (1877); Dockrill, *Aust. Orchid Rev.* 20: 74 (1955); Forster in Harris, *Wild Flowers Aust.* t. 18, col. (1947); Nicholls, *Wild Life* 5: 297 (1943); Nicholls, *Vict. Nat.* 52: t. 27 fig. D & E (1936); Rupp, *Aust. Orchid Rev.* 4: 104 (1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. M, col. (1934); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 59 fig. 2 (1914); Smith in O'Brien, *Gdnrs' Chron.* new ser. 23: 275 fig. 53 (1885), also in Pfitzer, *Natürl. PflFam.* II 6: fig. 106 (1889)—both as "*C. longifolia*" in err.

Vern.: Tartan Tongue-orchid (Hooded Orchid—N.S.W.). *Distr.*: Extremely localized in Victoria where known only from Marlo near the mouth of Snowy R., in heath fringing a "grass-tree swamp"; also N.S.W., Qd (south-east).

—Labellum *not hood-like*, rarely > 1 cm. wide, *without* prominent venation 3

3. Labellum *straight*, 2-3.5 cm. long and 5-10 mm. wide at centre, with *large boss* or hump toward apex (giving a \pm hatchet-like profile):

896. *C. subulata* (Labill.) Reichenb. f. *Beitr. syst. Pflk.* 15 (1871).

Malaxis subulata Labill. *Nov. Holl. Plant. Specim.* 2: 62, t. 212 (1806);

C. longifolia R. Br. *Prodr. Flor. Nov. Holl.* 317 (1810).

Illust.: Labillardière (*l.c.*); FitzGerald, *Aust. Orchids* 2²: t. col. (1885); Dockrill, *Aust. Orchid Rev.* 20: 74 (1955); Galbraith, *Wildflowers Vict.* t. 22 (1950); Reeves, *Wild Life* 7: 80 (1945); Goldsack, *S. Aust. Nat.* 22³: 9 (June 1944);

Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 302 i (1943); Rupp, *Aust. Orchid Rev.* 4: 103 (1939); Nicholls in Barrett, *Sun Nature Book* n. 1: 22 fig. 13, col. (1932), also n. 5: 35 (1934); Ewart, *Flor. Vict.* fig. 163 (1931); Rupp, *Guide Orchids N.S.W.* 75 (1930); Coleman, *Vict. Nat.* 46: 63 & t. 4 (1929); Dickins, *Vict. Orchids* 18 fig. 32 (1929); Mort in Sulman, *Wild Flowers N.S.W.* 2: 5. 59 fig. 1 (1914); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 22 (1911); Rodway, *Some Wild Flowers Tasm.* t. on 108 (1910), also *Tasm. Flor.* t. opp. 192 (1903); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 108 fig. A, col. (1858); Meredith, *Bush Friends Tasm.* t. 8, col. (1860); Bauer in Endlicher, *Icon. Gen. Plant.* t. 17 (1838)—FitzGerald and the last eight (Dickins to Bauer) as "*C. longifolia*".

Vern.: Large Tongue-orchid (Duck Orchid—Tas. & N.S.W.). **Distr.:** Widespread through southern Victoria on damp coastal and near-coastal heaths, from Lower Glenelg R. to Mallacoota, and locally common (e.g. Portland district, Grampians, Glenfyne near Cobden, Curdie's R., Arthur's Seat, Dandenongs, Tonimbuk, Nar-Nar-Goon, Waratah Bay, Wilson Prom., Lake King, Orbost & Marlo districts, Cape Conran, Cann R.); Tas., N.S.W., Qd (far south-east).

—Labellum contracting suddenly near basal third and then *manifestly falcate*, rarely > 2 cm. long, < 5 mm. wide at the very narrow centre, *without* any apical boss but bearing a row of 6-9 dark sessile calli along each side:

897. *C. leptochila* F. Muell. ex Benth. *Flor. aust.* 6: 334 (1873).

Illust.: FitzGerald, *Aust. Orchids* 1st: t. col. (1877); Dockrill, *Aust. Orchid Rev.* 20: 74 (1955); Reeves, *Wild Life* 7: 80 (1945), also Clark l.c. 359 (1945); Nicholls in Barrett, *Sun Nature Book* n. 5: 34 (1934); Dickins, *Vict. Orchids* 18 fig. 33 (1929); Pescott, *Orchids Vict.* t. opp. 80 (1928); Coleman, *Vict. Nat.* 44: t. 23 (1927), also l.c. 338 (1928); Pescott, *Vict. Nat.* 37: t. 5 fig. 3 (1921); Nicholls in Coleman, *J. Bot., Lond.* 67: t. 590, col. (1929); Godfrey, *Orchid Rev.* 37: 163, 165 (1929).

Vern.: Small Tongue-orchid. **Distr.:** Scattered through eastern Victoria south of the Dividing Range, sometimes on coastal heath but more frequently in well-watered highland forest, and mostly uncommon (Dandenongs, Emerald & Upper Beaconsfield, Beenak, Wilson Prom., Marlo, Cabbage-tree Ck, Murrungowar, Combienbar, Genoa R.); also N.S.W. (tablelands as far north as Yanoona in New England).

[Flowers of the last two species, and perhaps of others in the genus, are pollinated by male ichneumonid wasps (*Lissopimpla semipunctata*). In attempting to copulate with the orchid flowers, these insects effect cross-pollination. Details of this remarkable plant-insect relationship, involving the sex urge, have been fully discussed by Edith Coleman in *Vict. Nat.* 44: 20 (1927), 44: 333 (1928) and 46: 62 (1929).]

279. *PTEROSTYLIS* R. Br. (1810)

[Measurements of galea are to be taken *in a straight line* from its base to the petal-tips]

1. Labellum *filiform*, beset with *long yellow hairs* and protruding from the solitary flower like a tassel; galea 1-2" long, erect, narrow, with *prominent reticulate veins*; lateral sepals deflexed:

898. *P. barbata* Lindl. in *Edward's bot. Reg.* 25: Swan Riv. Append. liii (1840).

Illust.: FitzGerald, *Aust. Orchids* 1⁷: t. col. (1882); *Wild Life* 14: 214 (1951); Goldsack, *S. Aust. Nat.* 22²: 2 (June 1944); Garnet, *Wild Life* 1: 12 & 22 (Sept. 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 36 (1934); Ewart, *Flor. Vict.* fig. 167 (1931); Pescott, *Orchids Vict.* t. inter 32 & 33 (1928); Nicholls, *Vict. Nat.* 43: 71 fig. 15 (1926); Coleman, *Gum Tree* 5: 7 (Dec. 1920); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 116 fig. A, col. (1858), as "*P. squamata*"; Meredith, *Bush Friends Tasm.* t. 8, col. (1860), as "*P. squamata*"; Hatch, *Trans. roy. Soc. N.Z.* 77: t. 18 fig. 1 A-C (1949).

Vern.: Bearded Greenhood. *Distr.*: Scattered on sandy ground through western and south-eastern Victoria, from coastal heaths to Box-Ironbark forests of the goldfields and fringes of the Mallee, but mostly uncommon or rare (Lower Glenelg R., Portland district, Grampians, Little Desert, Ararat, Creswick, Castlemaine, Bendigo, Rushworth, Brisbane Range, Otways, Torquay, Point Lonsdale, Arthur's Seat, Bayswater-Heathmont area, Hurst Bridge, Won-thaggi, Wilson Prom., Marlo, Reedy Ck near Cann R.); all States except Qd, but very rare in N.S.W. (Maroubra), also N.Z. (rare).

—Labellum *flattened* (at least below), from broadly oblong to linear, *never* yellow-haired or tassel-like 2

2. Lateral sepals at length *deflexed*, *not* embracing the galea; labellum exposed and *extremely irritable*, springing up into the galea when touched; flowers usually *several* on the scape 32

—Lateral sepals mostly *erect or ascending*, *embracing the galea*; labellum often concealed, *not* or hardly irritable; flower *solitary*, rarely several to a stem (in *P. parviflora*) 3

3. Flowers usually 3 or more on scape, *very small* (galea \pm 1 cm. long); radical leaves *not* or seldom present at flowering time (autumn and winter):

899. *P. parviflora* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1⁷: t. col. (1882); Garnet, *Wild Life* 2: 12 (Mar. 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 38 (1934); Nicholls, *Vict. Nat.* 43: 74 fig. 3 (1926); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 116 fig. c, col. (1858), as "*P. aphylla*".

Vern.: Tiny Greenhood (Baby Greenhood—N.S.W.). *Distr.*: Excepting the Mallee, northern plains, alps, heavy forest, grassland, farmland and settled areas, widespread through Victoria from sea-level to subalpine slopes and often frequent on dry, stony, auriferous hills (e.g. in such dispersed localities as Lower Glenelg R., Portland, Grampians, Avoca, Creswick, Maryborough, Bendigo, Rushworth, Gisborne, Brisbane Range, Otways, Bayswater, Healesville & Marysville, Grantville, Wilson Prom., Sale, Marlo, Bendoc & Bidwell, Suggan Buggan, Limestone Ck, Cravensville, Mt. Buffalo); all States except W.A., but in Qd only the south-east.

—Flower normally *single* (very rarely 2 or 3 on scape); galea *much longer* than 1 cm. 4

4. Stem-leaves *reduced* to small and usually sheathing bracts, but normal foliage forming a radical rosette (sometimes absent at flowering time) 21

—Stem-leaves usually *well-developed* and spreading 5

5. Radical leaves *wanting* or clustered on a shoot separate from the peduncle, *often absent* at flowering time; flowers usually bearing conspicuous dark green, brown or reddish *striae* 12
 —Radical leaves encircling base of peduncle (except where scapes are abnormally etiolated through shade or overcrowding by other growths), *always present* at flowering time; flower seldom striped 6
6. Scape usually <4" high; galea \pm 2 cm. long; labellum *bifid* (rare heath-land plant):

900. *P. toveyana* Ewart & Sharman in *Proc. roy. Soc. Vict.* new ser. 28: 235, t. 28 (1916).

Illust.: Ewart & Sharman (*l.c.*); Nicholls, *Orchids Aust.* 1: t. 64, col. (1955); Garnet, *Wild Life* 1: 23 (July 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 36 (1934); Nicholls, *Vict. Nat.* 43: 74 fig. 9 (1926); Dickins, *Vict. Orchids* 21 (1929).

Vern.: Mentone Greenhood. *Distr.*: Scattered and occasional in western Victoria and along the eastern heathlands flanking Port Phillip Bay where now perhaps extinct, usually on sheltered sandy ground (Mentone-Aspendale-Frankston region where first discovered, Greensborough, Ararat, Grampians); also Tas. (Flinders Id, Eaglehawk Neck, Sandford & South Arm).

[*P. toveyana* is presumed to be a natural hybrid between *P. concinna* R. Br. and *P. alata* (Labill.) Reichenb. f., with both of which it is usually associated.]

- Scape usually >4" high; galea commonly much longer than 2 cm.; labellum-tip *always entire* (even in small plants or those with galea not exceeding 2 cm.) 7
7. Flower large (1-2" long), *glandular-pubescent*, *embraced* by the large uppermost leafy bract; tip of galea short and *abruptly decurved* (usually a coastal plant):

901. *P. cucullata* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: Nicholls, *Orchids Aust.* 2: t. 74, col. (1958); Clark, *Wild Life* 7: 262 (1945); Garnet, *Wild Life* 5: 329 (1943), also 1: 13 (Sept. 1939); Nicholls in Barrett, *Sun Nature Book* n. 1: 22 fig. 19, col. (1932), also n. 5: 36 (1934); Pescott, *Orchids Vict.* t. opp. 32 (1928), also *Vict. Nat.* 43: t. 20 (1927); Nicholls, *Vict. Nat.* 43: 106 fig. 23 (1926); Rupp, *Aust. Nat.* 5: 170 (1924); Fiveash in Rogers, *Proc. roy. Soc. Vict.* new ser. 28: t. 7 (1915); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 18 (1911).

Vern.: Leafy Greenhood. *Distr.*: Very scattered and uncommon along Victorian coasts between the extreme south-west at Nelson and Wilson Prom., favouring damp shaded sand under tea-tree scrub on the landward slope of dunes (Portland district, Cape Otway, Queenscliff, Sorrento & Rye, eastern shores of Port Phillip where probably now extinct, near Wonthaggi, Hedley), but having isolated occurrences on the Howqua R. near Mt. Timbertop and Dolodrook R. near Licola; also S.A. (far south-east, Mt. Lofty Range), Tas. (including King Id).

- Flower *glabrous* (except labellum), *free from* the uppermost bract; galea *not abruptly decurved* 8.
8. Galea very large (nearly always exceeding 4 cm.) and sharply acuminate, the upper half curving forward and downwards like a sickle:

902. *P. falcata* R. S. Rogers in *Proc. roy. Soc. Vict.* new ser. 28: 106, t. 9 (1915).

Illust.: Fiveash in Rogers (*l.c.*); Nicholls, *Orchids Aust.* 1: t. 71, col. (1955); Fiveash in Rupp, *Aust. Encycl.* 6: 412 B fig. 2, col. (1958); Galbraith, *Wild Life* 2: 14 (Sept. 1940); *Wild Life* 1: 30 (Oct. 1938); Nicholls in Barrett, *Sun Nature Book* n. 5: 30 fig. c, col. (1934); Coleman, *Vict. Nat.* 50: 249 & t. 41 (1934); Rupp, *Proc. Linn. Soc. N.S.W.* 58: 425 fig. 4 (1933), also 50: 302 fig. 2 (1925); Rupp, *Guide Orchids N.S.W.* 114 (1930); Dickins, *Vict. Orchids* 30 fig. 49 (1929); Pescott, *Orchids Vict.* t. opp. 48 (1928); Nicholls, *Vict. Nat.* 44: 42 fig. 9 (1927), also 43: 71 fig. 5 (1926).

Vern.: Sickie Greenhood. *Distr.*: In Victoria scattered through forests of the southern west and most of the east, from sea-level into the highlands and sometimes locally common, usually restricted to damp shaded situations along stream-banks or on low-lying inundated ground (e.g. Portland district, Grampians, Ararat, Glenfyne, W. Otways, Trentham, Arthur's Seat, Dandenong Ck near Bayswater, Warburton, Upper Jamieson R., Mt. Timbertop, Warby Range, Cravensville on Tallangatta Ck, Bogong High Plains, Limestone Ck & Upper Murray R., San Remo & Lang Lang, Wonthaggi, Foster, Yarram, Sale, Paynesville, Moroka Glen & Mt. Wellington, Orbost district, Noorinbee on Cann R., Bidwell on Upper Delegate R.); also Tas. (north—Smithton, Blessington), N.S.W. (rare—Braidwood district, Burrawang, Barrington Tops).

—Galea rarely attaining 4 cm., the upper half *not* long-acuminate and sickle-shaped 9

9. Flower narrow (5-8 mm. between sinus and back of galea), usually *dark brownish* at the tip; lateral sepal-points *erect*, rising high above the galea; labellum usually protruding through sinus:

903. *P. foliata* Hook. f. *Flor. N.-Z.* 1: 249 (1853).

P. gracilis W. H. Nicholls in *Vict. Nat.* 43: 324, 325 fig. a-1 (1927).

Illust.: Nicholls (*l.c.*), also *Orchids Aust.* 2: t. 77 & 78, col. (1958); Nicholls in Barrett, *Sun Nature Book* n. 5: 38 (1934); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 114 fig. A, col. (1858), as "*P. pedunculata*"; Hatch, *Trans. roy. Soc. N.Z.* 77: t. 20 (1949); Smith in Cheeseman, *Ill. N.Z. Flor.* 2: t. 196 (1914).

Vern.: Slender Greenhood. *Distr.*: Scattered on forest slopes of south-west, southern and north-eastern Victoria, but uncommon and apparently absent from East Gippsland (Portland district, Ararat, Anglesea, Greensborough, Kinglake Nat. Park, Dandenongs, Wandin & Healesville, Mirrimbah near Mt. Buller, Cravensville on Tallangatta Ck, Wilson Prom.); also Tas. (widespread), N.Z.

—Flower broadish (usually 10 mm. wide or more), *green throughout*; sepal-points directed either *forwards or backwards* or, when straight, not much higher than the galea 10

10. Galea evenly curved and *erect throughout*; sinus of lateral sepals narrow, forming an angle of $\pm 45^\circ$ (rare south-western plant with stalked lower leaves):

904. *P. furcata* Lindl. *Gen. & Spec. orchid. Plant.* 390 (1840).

Illust.: Nicholls, *Orchids Aust.* 1: t. 67, col. (1955); Nicholls, *Vict. Nat.* 65: 256 fig. A-K (1949), also 66: 239 (1950) and 43: 106 fig. 24 (1926); Nicholls in Barrett,

Sun Nature Book n. 5: 38 (1934); Rupp, *Proc. Linn. Soc. N.S.W.* 50: 302 fig. 1 (1925); Fiveash in Rogers, *Proc. roy. Soc. Vict.* new ser. 28: t. 8 (1915), also *Trans. roy. Soc. S. Aust.* 31: t. 22 (1907); Hatch, *Trans. roy. Soc. N.Z.* 77: t. 29 (1949), also 80: 327 (1953).

Vern.: Forked Greenhood. **Distr.:** Localized and extremely rare in Victoria where known with certainty only by a single collection from Condah, 22 miles S.W. of Hamilton (Nov. 1905), other collections so named in the past (e.g. from Buninyong, Dandenongs, Bogong High Plains) being now considered as referable to *P. falcata* (q.v.); N.S.W. (Kosciusko region), S.A. (Mt. Gambier, Kangaroo Id), Tas. (widespread), N.Z.

[H. M. R. Rupp has expressed the opinion that *P. furcata* forms a link between *P. falcata* and *P. alpina*; but possible hybridism is negated by the fact that neither of these species occurs in New Zealand where *P. furcata* is frequent in subalpine *Calorophus* bogs of the North Id.]

—Galea erect in lower half, then rather *abruptly bent forward*; sinus wide (almost a right angle) 11

11. Lower sepals erect below, their free points *reflexed at right angles* across the blunt galea; labellum hardly protruding; leaves *all stem-clasping*:

905. *P. alpina* R. S. Rogers in *Proc. roy. Soc. Vict.* new ser. 28: 108, t. 9 (1915).

Illust.: Fiveash in Rogers (l.c.); Nicholls, *Orchids Aust.* 1: t. 70, col. (1955); Galbraith, *Wildflowers Vict.* t. 20 (1950); Garnet, *Wild Life* 1: 22 (Sept. 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 36 (1934); Nicholls, *Vict. Nat.* 43: 71 fig. 4 (1926); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 115 fig. A, col. (1858), as "*P. cucullata*"; Meredith, *Bush Friends Tasm.* t. 8, col. (1860), as "*P. cucullata*".

Vern.: Alpine Greenhood. **Distr.:** Locally abundant in montane and subalpine forests of eastern Victoria, but not strictly "alpine" as the name would suggest, growing often along the shaded banks of streams or amongst moss and grass on rocky slopes (e.g. Dandenongs, Healesville & Warburton, Marysville & Lake Mtn., Baw Baws, King R. near Mt. Cobbler, Moroka R. near Mt. Wellington, Maffra, Strzelecki Ranges, Wilson Prom., Brodribb R., Combienbar, Bonang), with isolated western occurrences in the Grampians, Otways, Brisbane Range and Woodend district; also N.S.W. (localized—Kosciusko region, Mt. Wilson in Blue Mtns., head of Macleay R.), Tas. (Great Lake Rd. at 2-3500 ft., Cradle Mtn., Hellyer R.).

—Lower sepals *not* sharply reflexed; galea *acuminate*, > 1" long; labellum pubescent, usually *protruding conspicuously* through sinus; lower leaves distinctly *petiolate*:

906. *P. acuminata* R. Br. *Prodr. Flor. Nov. Holl.* 326 (1810)

var. *ingens* H. M. R. Rupp in *Proc. Linn. Soc. N.S.W.* 53: 552 (1928), atque l.c. 58: 228 (1933).

Illust.: Nicholls, *Orchids Aust.* 1: t. 69, col. (1955); Coleman, *Vict. Nat.* 50: t. 40 (1934); Nicholls in Barrett, *Sun Nature Book* n. 5: 38 (1934); Nicholls, *Vict. Nat.* 44: 42 fig. e-f (1927), also 43: 102 fig. 16 (1926); Green, *Vict. Nat.* 42: t. 5 fig. 1-2 (1925).

Vern.: Sharp Greenhood (Pointed Greenhood). **Distr.:** Very scattered in damp shady parts of eastern Victoria, usually in mountain-forests and uncommon (Bayswater, Healesville, Mt. Timbertop near Mansfield, Indigo Falls between

Wodonga & Beechworth, Cravensville on Tallangatta Ck, Orbost & Brodribb R.); also S.A. where extremely localized (Port Elliot district) and perhaps now extinct, Tas. (Mt. Barrow Rd.).

[The typical form, with flowers only about *half* the size and more acuminate *glabrous* labellum, is apparently restricted to New South Wales and southern Queensland, possibly extending to New Caledonia—see Nicholls *l.c.* t. 68 (1955), FitzGerald, *Aust. Orchids* 1⁵: t. col. (1879) and Curtis's *bot. Mag.* 62: t. 3401, col. (1835). The species is also reported to occur in New Guinea.]

12. Petals *widely dilated* above, forming a broad reddish-brown flange to the decurved part of galea; upper half of labellum long-exserted, *filiform with a clavate tip* (flower 1-2" long):

907. *P. grandiflora* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: Nicholls, *Orchids Aust.* 2: t. 80, col. (1958); Clark, *Wild Life* 7: 168 (1945); Scammell in Rupp, *Orchids N.S.W.* t. 14 opp. 86 (1943); Green in Barrett, *Aust. Wildflower Book* t. opp. 48 (1942); Garnet, *Wild Life* 1: 23 (July 1939); Hamilton, *Aust. Orchid Rev.* 1²: 22 (June 1936); Nicholls in Barrett, *Sun Nature Book* n. 5: 30 fig. B, col. (1934); Dickins, *Vict. Orchids* 30 fig. 50 (1929); Pescott, *Orchids Vict.* t. inter 48 & 49 (1928), also *Vict. Nat.* 41: t. 7 fig. 1 (1925); Coleman, *Vict. Nat.* 45: 112-113 (1928); Nicholls, *Vict. Nat.* 45: 45 fig. 13 (1928), also 43: 102 fig. 17 (1926); Rupp, *Guide Orchids N.S.W.* 108 (1930), also *Proc. Linn. Soc. N.S.W.* 50: 304 fig. 6 (1925); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 63 fig. 1 (1914); Domin, *Bibl. bot., Stuttgart* 20 (Heft 788): 548 (1915); Bauer, *Ill. Flor. Nov. Holl.* t. 2 (1813).

Vern.: Cobra Greenhood (Long-tongue & Superb Greenhood). *Distr.*: Occasional in near-coastal districts of Victoria east from Port Phillip, where now very rare or extinct, favouring moist sandy ground in shaded forest gullies or amongst bracken in more open situations (South Belgrave near Mt. Morton, Officer & Pakenham, Grantville & Almurta, Wonthaggi, Inverloch, Yarram, Marlo district, Mt. Raymond near Orbost); Tas. (east coast—St. Helens, Scamander Tier, Coles Bay), N.S.W., Qd (south-east).

—Petals *not* very wide and dark in upper portion of galea; labellum neither *filiform nor* with a clavate apex 13

13. Galea exceeding 4 cm. (from base to filiform tip), scythe-shaped; labellum acuminate, decurved; petals *acuminate* (flowers opening in autumn):

908. *P. revoluta* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: Nicholls, *Orchids Aust.* 2: t. 81, col. (1958); Garnet, *Wild Life* 3: 115 (1941), also 2: 12 (Mar. 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 30 fig. 1, col. (1934); Rupp, *Guide Orchids N.S.W.* 111 (1930), also *Proc. Linn. Soc. N.S.W.* 53: 553 fig. 2 (1928); Coleman, *Vict. Nat.* 46: t. 5 (1929); Pescott, *Orchids Vict.* t. inter 32 & 33 (1928); Nicholls, *Vict. Nat.* 45: 45 fig. 12 (1928), also 43: 102 fig. 19 (1926); Rupp, *Aust. Nat.* 6: 61 (1927). Ewart, *Proc. roy. Soc. Vict.* new ser. 28: t. 27 fig. 1-2 (1916); Nodder in Banks & Soland, *Ill. aust. Plant. Cook's Voy.* 3: t. 302 fig. B (1905).

Vern.: Autumn Greenhood. *Distr.*: Widespread in scattered communities over dry stony hills of western, central and north-eastern Victoria, chiefly on the gold-fields and almost invariably in box forest where sometimes accompanying low

tussocks of grass (e.g. Grampians, near Nhill, Ararat, St. Arnaud, Maryborough, Maldon & Castlemaine, Whipstick Scrub & Barnadown near Bendigo, Coimadai & Toolern Vale, Brisbane Range, Warrandyte-Eltham-Hurst Bridge area, Strathbogie Ranges, Graytown & Rushworth, Warby Range, Everton, Tallangatta, Upper Murray R.), with isolated eastern occurrences at Suggan Buggan, Deddick and Mt. Raymond near Orbost; also N.S.W., Qd (far south in Granite Belt near Stanthorpe).

—Galea <4 cm. long or, if ever 4 cm., then the petals obtuse to subacute 14

14. Dorsal sepal *not* much exceeding the petals or, if ever long-filiform, then the labellum much decurved and long-acuminate 16

—Dorsal sepal ending in a *long deflexed filiform point*, far exceeding the petals; labellum slightly curved, the tip *obtuse* or subacute; sinus of paired lower sepals narrowly or widely V-shaped when viewed from front 15

15. Galea \pm 1.5 cm. high; sinus narrow; labellum *lanceolate*, almost as long as column (rare slender plant of the Far South-west, flowering in spring):

909. *P. tenuissima* W. H. Nicholls in *Vict. Nat.* 67: 46, 47 fig. K-P (1950).

Illust.: Nicholls (*l.c.*).

Vern.: Swamp Greenhood. *Distr.*: Localized and rare in south-western Victoria where apparently endemic, inhabiting only inundated, very swampy and shaded ground under dense thickets of *Leptospermum lanigerum* (the type locality at Long Swamp near Nelson, Johnstone's Ck \pm 18 miles farther east, Cudgee Ck, Peterborough).

—Galea \pm 2.5 cm. high; sinus narrow; labellum *ovoid-oblong*, much shorter than column; tips of lateral sepals \pm *erect* (rare plant of South Gippsland, flowering in early winter):

910. *P. fischii* W. H. Nicholls in *Vict. Nat.* 67: 45, 47 fig. A-J. (1950).

Illust.: Nicholls (*l.c.*), also *Orchids Aust.* 2: t. 83, col. (1958).

Vern.: Known in Victoria only from the type locality at Woodside near Yarram where rare, inhabiting sandy undulating ground under bracken in light forest; also N.S.W. (Grose R. valley in Blue Mtns., May 1955)—a remarkable disjunction in range.

—Galea 2 cm. long or more; sinus wide; labellum narrowly *oblong*, slightly longer than column and curved forward distally so as to protrude beyond sinus; tips of lateral sepals *diverging widely* from galea (widespread, often montane plant, flowering in summer):

911. *P. decurva* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 47: 339, t. 27 (1923).

Illust.: Fiveash in Rogers (*l.c.*); Nicholls, *Orchids Aust.* 2: t. 84, col. (1958); Nicholls in Barrett, *Sun Nature Book* n. 5: 35 (1934); Arnold in Ewart, *Flor. Vict. frontisp. fig. 3, col.* (1931); Rupp, *Guide Orchids N.S.W.* 114 (1930), also *Proc. Linn. Soc. N.S.W.* 50: 304 fig. 5 (1925); Dickens, *Vict. Orchids* 30 fig. 52 (1929); Pescott, *Orchids Vict.* t. inter 48 & 49 (1928), also *Vict. Nat.* 41: t. 7 fig. 2 (1925); Nicholls, *Vict. Nat.* 43: 74 fig. 7 (1926); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 115 fig c, col. (1858), as "*P. obtusa*".

Vern.: Summer Greenhood. *Distr.*: Widespread in cooler montane forests of Victoria, ascending to the sub-alps, but seldom abundant (e.g. Mt. Cole, Mt. Macedon, Bolwarrah, Kinglake Nat. Park, Dandenongs, Gembrook, Mt. Howitt, Barry Mtns., Harrietville, Cobungra, Dargo High Plains, Mt. Wellington, near Maifra, Mt. Buck, Upper Cann R., Bendoc, Black Mtn. near Coborras), with a very isolated lowland occurrence on sand near mouth of Glenelg R.; also Tas. (widespread), N.S.W. (ranging sparsely as far north as Ebor in New England).

16. Petals with fine, *acuminate to filiform points*; labellum-tip finely *acuminate* and much decurved (rare plant of East Gippsland, flowering in autumn):

912. *P. reflexa* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: Nicholls, *Orchids Aust.* 2: t. 86, col. (1958); FitzGerald, *Aust. Orchids* 1^b: t. col. (1879); Nicholls, *Vict. Nat.* 56: 26 (1939); Rupp, *Proc. Linn. Soc. N.S.W.* 58: 425 fig. 5 (1933), also 53: 553 fig. 1 (1928); Rupp, *Guide Orchids N.S.W.* 110 (1930); Coleman, *Vict. Nat.* 46: t. 5 (1929); Rupp, *Aust. Nat.* 6: 61 (1927); Ewart, *Proc. roy. Soc. Vict.* new ser. 28: t. 27 fig. 3-6 (1916).

Vern.: Small Autumn Greenhood (Dainty & Moss Greenhood—N.S.W.). *Distr.*: Very localized in Victoria where known from only three isolated localities in East Gippsland (viz. Mt. Raymond near Orbost, Cann R. south of Prince's Highway, and Mt. Kaye by Upper Cann R. valley), but not uncommon there on dryish granitic soil under eucalypt forest; also N.S.W., Qd (far south-east).

—Petals obtuse or acute, but *never* long-acuminate

17. Flower exceeding 3 cm., appearing *truncate* by reason of the *very broad blunt* petals, the apices of which *decurve* away from the dorsal sepal-point; scape often very short (sometimes 1-2"), flowering in autumn:

913. *P. truncata* R. D., FitzG. *Aust. Orchids* 1^a: + t. col. (1878).

Illust.: FitzGerald (*l.c.*); Nicholls, *Orchids Aust.* 2: t. 90, col. (1958); Galbraith, *Wildflowers Vict.* t. 21 (1950); Nicholls, *Wild Life* 7: 79 (1945); Garnet, *Wild Life* 1: 23 (July 1939); Nicholls in Barrett, *Sun Nature Book* n. 1: 22-23 fig. 21, col. (1932), also n. 5: 30 fig. e, col. (1934); Nicholls, *Vict. Nat.* 49: 116 (1932), also 45: 45 fig. 9 & 15 (1928), 43: 74 fig. 14 (1926) and 42: t. 2 (1925); Rupp, *Guide Orchids N.S.W.* 109 (1930), also *Proc. Linn. Soc. N.S.W.* 58: 425 fig. 6 (1933); Rupp, *Aust. Nat.* 6: 61 (1927).

Vern.: Brittle Greenhood (Little Dumpy). *Distr.*: In Victoria confined to a few small and disjunct areas all within 40 miles of Melbourne, either on open grassland, in light box forest, heathland or among granite boulders, but each colony usually consisting of several hundred plants (Brisbane Range, You Yangs, Coimadai district, Tottenham-Sunshine region where probably now obliterated by housing, South Belgrave near Mt. Morton, Beaumaris where doubtless extinct); also N.S.W. (Nandewar Range near Barraba, Hillgrove and South Maitland Coalfields area where locally abundant), Blue Mts.

—Flower up to 3 cm. long (rarely more); petals *connivent throughout* with the dorsal sepal or, if decurving slightly, then *never* dilated or very obtuse at apex

18. Flower *conspicuously striped*, appearing in *winter or early spring*; labellum *acute*

—Flower green, *hardly striped*, appearing usually in *late autumn*; labellum *very obtuse* at apex 19

19. Labellum 1.5 cm. long or more, slightly *constricted at centre*, very broad and *almost filling the entrance to galea* (very rare South Gippsland plant):

914. *P. crypta* W. H. Nicholls in *Vict. Nat.* 61: 207, 209 fig. A-F (1945).

Illust.: Nicholls (*l.c.*), also *Orchids Aust.* 2: t. 92 fig. a-f, *col.* (1958).

Vern.: Hidden Greenhood. *Distr.*: Known only from the type locality "in sandy soil along Waratah Bay" near the southern end of Hoddle Ranges, South Gippsland, Vic.

[The three known specimens of this orchid were collected simultaneously (May 1941), in association with *P. obtusa* R. Br. As suggested by Nicholls (*l.c.*), they may represent a self-pollinating mutant of the latter species. A similar relationship seems to exist between *P. nana* R. Br. and colonies of the remarkable *P. celans* H. M. R. Rupp (*g.v.*) in Portland district, S.W. Victoria.]

—Labellum \pm 1 cm. long, oblong-linear, neither constricted, contracted nor obstructing the entrance to galea, never emarginate, *shorter than* column and *not* protruding beyond sinus of paired lateral sepals which appears very broadly M-shaped when viewed from front of flower, but projecting and lip-like from side; sepal-tips \pm *clubbed* (widespread non-gregarious plant):

915. *P. obtusa* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: Nicholls, *Orchids Aust.* 2: t. 85 fig. b-h, k-p, *col.* (1958); FitzGerald, *Aust. Orchids* 1st: t. *col.* (1880); Clark, *Wild Life* 8: 71 (1946); Scammell in Rupp, *Orchids N.S.W.* t. 15 opp. 92 (1943); Garnet, *Wild Life* 3: 114 (1941), also 2: 13 (Mar. 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 30 fig. G, *col.*, 38 (1934); Rupp, *Guide Orchids N.S.W.* 113 (1930); Rupp, *Aust. Nat.* 6: 61 (1927); Nicholls, *Vict. Nat.* 43: 74 fig. 6 (1926), also 45: 45 fig. 1-8 (1928).

Vern.: Blunt-tongue Greenhood. *Distr.*: Widespread and locally frequent through eastern Victoria in a variety of habitats, from sandy coastal heaths to grassy or ferny slopes of montane forests, and ascending to rocky terrain in the sub-alps (e.g. Kinglake Nat. Park, Dandenongs, Marysville, Yea, Wonthaggi, Waratah Bay, Toora & Hedley, Mt. Wellington, Nunniong Plateau, Cobboras & Ingeegoodbee R., Bendoc, Cann R., Genoa), but more scattered and uncommon in the west (Grampians, Mt. Macedon & Riddell, Gisborne & Bullengarook); S.A., N.S.W., Qd (south-east).

—Labellum 9 mm. long, \pm coffin-shaped, *contracted* at distal third, very blunt and sometimes *emarginate*, at least *as long as* column and *protruding* beyond sinus which appears V-shaped from front of flower (very localized, *gregarious* coastal plant—*forming colonies* of several square yards—in South and East Gippsland):

16. *P. alveata* J. R. Garnet in *Vict. Nat.* 56: 91, 92 fig. A-N (1939).

Illust.: Garnet (*l.c.*); Nicholls, *Orchids Aust.* 2: t. 85 fig. a, i, j, *col.* (1958), as "*P. obtusa* form"; Garnet, *Wild Life* 2: 13 (Mar. 1940); *Vict. Nat.* 56: t. 10 (1940).

Vern.: Greenhood. *Distr.*: Apparently endemic in Victoria where known only from Corner Inlet (Little Snake Island near Yarram) and Genoa in the extreme east—on black, coastal sand amongst bracken in stringybark forest.

20. Galea up to 2.5 cm. (rarely 3 cm.) high, whitish or grey-green with reddish-brown striæ; labellum \pm 10 mm. long:

917. *P. alata* (Labill.) Reichenb. f. *Beitr. syst. Pflk.* 70 (1871).

Disperis alata Labill. *Nov. Holl. Plant. Specim.* 2: 59, t. 210 (1806).

Illust.: Labillardière (*l.c.*); Nicholls, *Orchids Aust.* 2: t. 93, col. (1958); FitzGerald, *Aust. Orchids* 1st: t. col. (1877), as "*P. striata*"; Clark, *Wild Life* 7: 167 (1945); Garnet, *Wild Life* 2: 12 (Mar. 1940), also 1: 23 (July 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 38 (1934); Nicholls, *Vict. Nat.* 45: 45 fig. 14 (1928), also 43: 102 fig. 22, 106 fig. 22 (1926).

Vern.: Striped Greenhood (Striated & Purplish Greenhood). *Distr.*: Except for the Mallee, northern plains, north-east, alps, grasslands and settlements, a widespread orchid in Victoria from sandy coastal heaths, where locally common, to drier sclerophyll forests of the goldfields (e.g. Lower Glenelg R., Portland district, Grampians, Ararat, St. Arnaud, Castlemaine, Coimadai, Lerderberg & Werribee Gorges, Brisbane Range, Otways, Queenscliff, eastern heathlands of Port Phillip where now rare, Eltham-Hurst Bridge area, Beaconsfield, Wonthaggi, Wilson Prom. & Sunday Id, Sale, Orbost where very rare); S.A., Tas. (widespread), N.S.W. (extremely rare—Yass, and perhaps south coast).

—Galea \pm 3 cm. high, pale green with darker green stripes; scape often very short (sometimes 1-2"); labellum \pm 15 mm. long:

918. *P. robusta* (Ewart & Sharman) R. S. Rogers in *Trans. roy. Soc. S. Aust.* 51: 296 (1927).

P. præcox Lindl. var. *robusta* Ewart & Sharman in *Proc. roy. Soc. Vict.* new ser. 28: 234, t. 27 fig. 7 (1916).

Illust.: Ewart & Sharman (*l.c.*); Erickson, *Orchids of the West* t. 13 fig. 4 (1951); Clark, *Wild Life* 7: 167 (1945); Goldsack, *S. Aust. Nat.* 22nd: 2 (June 1944); Garnet, *Wild Life* 1: 13-14 (July 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 36 (1934); Nicholls, *Vict. Nat.* 50: 90 fig. A-C (1933), also 45: 45 fig. 10 (1928) and 43: 102 fig. 18 (1926); Rupp, *Proc. Linn. Soc. N.S.W.* 53: 553 fig. 3 (1928); Pelloe, *W. Aust. Orchids* t. opp. 64 fig. 13, col. (1930); Nicholls in Pescott, *Vict. Nat.* 42: t. 2 (1925); Pelloe, *Wildflowers W. Aust.* 36 (1921); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 8 (1911); Sargent, *Ann. Bot.* 23: t. 18 (1909), also Stanway-Tapp in Sargent *l.c.* t. 19 (1909)—the last five (Nicholls to Stanway-Tapp) as "*P. reflexa*".

Vern.: Larger Striped Greenhood (Sharp-leaf Greenhood, Green Shell Orchid—W.A.). *Distr.*: In Victoria apparently confined to savannah, light box forests or exposed rocky places of drier western and northern districts where sometimes plentiful in scattered colonies, overlapping with *P. alata* on the goldfields but extending into more arid country (Big & Little Deserts, Dimboola, Kewell, Ararat, St. Arnaud, Wedderburn, Bealiba & Mt. Moliagul, Bendigo district, Clydesdale near Yandoit, Coimadai, Rushworth, Cravensville in far north-east); also S.A., W.A. (often in coastal areas).

21. Labellum 7-10 mm. long, oblong, *conspicuously bifid* at apex (flower erect, green with longitudinal *brownish stripes*, appearing in winter and early spring):

919. *P. concinna* R. Br. *Prodr. Flor. Nov. Holl.* 326 (1810).

Illust.: Curtis's bot. Mag. 62: t. 3400, col. (1835); Nicholls, *Orchids Aust.* 1: t. 63, col. (1955); FitzGerald, *Aust. Orchids* 1st: t. col. (1880); Galbraith, *Wildflowers Vict.* ed. 2: t. 25 B (1955); Garnet, *Wild Life* 1: 23 (July 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 35 (1934); Ewart, *Flor. Vict.* fig. 169 (1931); Nicholls, *Vict. Nat.* 43: 74 fig. 8 (1926); Rupp, *Aust. Nat.* 6: 61 (1927) Hooker, *J. Bot., Lond.* 1: t. 136 (1834).

Vern.: Trim Greenhood. *Distr.*: In Victoria chiefly on damp sandy soil of heathland and scrubby eucalypt forest along and near the coast where sometimes frequent (e.g. Portland, Airey's Inlet, Point Lonsdale, Brisbane Range, You Yangs, Arthur's Seat, Frankston & Cheltenham whence now rapidly disappearing, Greensborough district, Cardinia Ck, Wilson Prom. & Snake Id, Yarram, Sale, Lakes Entrance, Orbost, Cann R.), with more scattered inland occurrences in the Grampians, at Ararat, Coimadai and Cravensville (far north-east); S.A. (extremely rare if present, records for Bugle Range being dubious), Tas., N.S.W., Qd (south-east).

—Labellum *entire* at apex 22

22. Dorsal sepal acute to acuminate, but *never* long-filiform at apex (slender to robust plants) 27

—Dorsal sepal ending in a long *filamentous* and often *decurved* point (very slender plants) 23

23. Galea up to 1.5 cm. long (*excluding* the filamentous tip); labellum-lamina *extremely short* (\pm 3 mm. long), ovoid or oblong, equal to or shorter than the penicillate basal appendage; a rosette of leaves encircling the base of peduncle at flowering time (March-July):

920. *P. pedoglossa* R. D. FitzG. *Aust. Orchids* 1st: + t. col. (1877).

Illust.: FitzGerald (*l.c.*); Nicholls, *Orchids Aust.* 2: t. 94, col. (1958); Garnet, *Wild Life* 2: 13 (Mar. 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 38 (1934); Nicholls, *Vict. Nat.* 43: 74 fig. 13 (1926).

Vern.: Prawn Greenhood (Tailed Greenhood). *Distr.*: Restricted in Victoria to a few very isolated areas of coastal heath on and east of Port Phillip, usually inhabiting damp shaded sand under thickets or dense bracken, but locally common (Black Rock-Springvale-Frankston regions where now scarce and vanishing rapidly through housing developments, Marlo, Mallacoota); also Tas. (Coles Bay, Eaglehawk Neck & Tasman Penins.), N.S.W. (Central Coast region between National Park and Gosford).

—Galea 2 cm. long or more; flowering peduncle *devoid* of a basal rosette of leaves 24

24. Labellum *obtuse*, almost *straight* 26

—Labellum *long-acuminate*, \pm *decurved* 25

25. Flower 2-3 cm. long; labellum $> \frac{1}{2}$ the length of galea:

P. reflexa R. Br. [See No. 912].

—Flower much > 3 cm. long; labellum $< \frac{1}{2}$ the length of galea:

P. revoluta R. Br. [See No. 908].

26. Labellum linear-oblong, > 10 mm. long; flowering time in summer:
P. decurva R. S. Rogers [See No. 911].
 —Labellum ovoid-oblong, < 10 mm. long; flowering time early in winter:
P. fischii W. H. Nicholls [See No. 910].
27. Galea 2 cm. long or more; lateral sepal-points rarely erect and *not* far exceeding the galea 29
 —Galea small, \pm 1.5 cm. long or less; lateral sepals with long *erect points* rising high above galea 28
28. Scape usually 6-12" long; galea dark reddish-brown toward the apex; labellum *thick, ovoid*, much *shorter than* column which is \pm 10 mm. high:

921. *P. pedunculata* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: Nicholls, *Orchids Aust.* 2: t. 95, col. (1958); FitzGerald, *Aust. Orchids* 1⁵: t. col. (1879); Clark, *Wild Life* 10: 496 (1948); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Garnet, *Wild Life* 1: 22 (Sept. 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 35 (1934); Pescott, *Orchids Vict.* t. inter 32 & 33 (1928); Nicholls, *Vict. Nat.* 43: 74 fig. 12 (1926); Rupp, *Aust. Nat.* 6: 61 (1927); Rodway, *Tasm. Flor.* t. opp. 200 (1903); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 114 fig. B, col. (1858), as "*P. nana*".

Vern.: Maroon-hood (Greentops—Tas., Little Red Riding-Hood—N.S.W.).

Dist.: Widespread through cooler parts of Victoria (except the alps) in a variety of habitats, more abundant on sandy ground under coastal tea-tree scrub but extending into mountain-forest and even shaded fern gullies (e.g. Lower Glenelg R., Portland, Grampians, Mt. Beckworth, Brisbane Range, Otways, eastern heathlands of Port Phillip, Kinglake Nat. Park, Eltham, Dandenongs, Quail Id in Western Port, Wilson Prom. & Sunday Id, Bairnsdale, Marlo, Genoa, R. gorge. Cravensville in far north-east, Mt. Timbertop); all States except W.A., but in Qd only the south-east.

—Scape rarely attaining 6"; galea *wholly green*; labellum *thick, oblong*, much *shorter than* column which is \pm 8 mm. high:

922. *P. nana* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: Nicholls, *Orchids Aust.* 2: t. 76, col. (1958); Erickson, *Orchids of the West* t. 13 fig. 1 (1951); Clark, *Wild Life* 7: 167 (1945); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 302 ii (1943); Garnet, *Wild Life* 1: 22 (Sept. 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 30 fig. J, col. (1934); Dickins, *Vict. Orchids* 21 (1929); Nicholls, *Vict. Nat.* 43: 106 fig. 29 (1926); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 13 (1911); Hatch, *Trans. roy. Soc. N.Z.* 77: t. 19 fig. 1 A-E (1949).

Vern.: Dwarf Greenhood. *Dist.*: Probably the most widespread orchid in Victoria, ranging from desert sand-hills in the Far North-west (Kulkyne & Wyperfeld Nat. Parks) to clay slopes or ironstone ridges in the goldfields, granite crevices (You Yangs, Warby Range), mountain-forest gullies (Cravensville, Cobungra) and coastal heaths (Lower Glenelg R., Apollo Bay, Frankston, Marlo, Mallacoota etc.), but never alpine; all States except Qd, but remarkably localized and rare in N.S.W. (Cobar district), also N.Z. (North Id where now increasingly rare).

—Scape $\pm 4''$; galea wholly green; labellum *membranous and petaloid*, broadly *fusiform*, ± 1 cm. long and *far exceeding* the column:

923. *P. celans* H. M. Rupp in *Vict. Nat.* 61: 106 + fig. (1944).

Illustr.: Rupp (*l.c.*); Nicholls, *Vict. Nat.* 61: 209, fig. G-J (1945); Nicholls, *Orchids Aust.* 2: t. 92 fig. g-t, *col.* (1958).

Vern.: Portland Greenhood. *Distr.*: Known only from the Portland district, S.W. Victoria, where it appeared in several successive seasons (from Oct. 1943). Relationships are with *P. nana* R. Br., and the possibility that it represents a curious teratological form of that widespread species cannot be ignored.

29. Flower conspicuously *nodding*; lateral sepals *horizontal or even deflexed*; labellum 13-16 mm. long, broad-linear, much recurved, greenish-red, \pm *pubescent*:

924. *P. nutans* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illustr.: Hooker in *Curtis's bot. Mag.* 58: t. 3085, *col.* (1831); Nicholls, *Orchids Aust.* 2: t. 96, *col.* (1958); FitzGerald, *Aust. Orchids* 1st: t. *col.* (1880); Willis in Hyett, *Vict. Nat.* 76: 241 (1960); Galbraith, *Wildflowers Vict.* t. 18 (1950), also ed. 2: t. 24 B (1955); *Wild Life* 14: 214 (1951), also 11: 506 (1949) and 9: 267 (1947); Forster in Harris, *Wild Flowers Aust.* t. 17, *col.* (1947); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Garnet, *Wild Life* 5: 333 (1943), also 1: 22 (Sept. 1939); Green in Barrett, *Aust. Wildflower Book* t. opp. 148 (1942); Nicholls in Barrett, *Sun Nature Book* n. 1: 22 fig. 10, *col.* (1932), also n. 5: 35 (1934); Ewart, *Flor. Vict.* fig. 168 (1931); Rupp, *Proc. Linn. Soc. N.S.W.* 58: 425 fig. 1 (1933); Nicholls, *Vict. Nat.* 44: 42 fig. a (1927), also 43: 71 fig. 10 (1926); Dickens, *Vict. Orchids* 30 fig. 51 (1929); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 62 fig. 2 (1914); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 15 (1911); Hatch, *Trans. roy. Soc. N.Z.* 77: t. 18 fig. 2 D-G (1949).

Vern.: Nodding Greenhood (Cow-horns—Tas., Parrot's Beak Orchid—N.S.W.). *Distr.*: Except for the Mallee, northern plains, alps, grasslands and settled areas, a widespread and locally abundant species throughout cooler parts of Victoria (e.g. in places as far-flung as Lower Glenelg R., Grampians, Apollo Bay, Brisbane Range, Dandenongs, Whipstick Scrub near Bendigo, Rushworth, Warby Range, Cravensville, Suggan Buggan, Genoa R., Lakes Entrance, Sale, Wilson Prom., Quail Id); all States except W.A., also N.Z. (very localized and rare—at Kaitaia & Whangaparaoa in North Id.)

—Flower *erect*, the lateral sepals variously *ascending* 30

30. Points of lateral sepals *short, hardly exceeding* the galea; labellum curiously *twisted*, oblong, up to 15 mm. long:

925. *P. curta* R. Br. *Prodr. Flor. Nov. Holl.* 326 (1810).

Illustr.: Hooker in *Curtis's bot. Mag.* 58: t. 3086, *col.* (1831); Nicholls, *Orchids Aust.* 1: t. 65, *col.* (1955); FitzGerald, *Aust. Orchids* 1st: t. *col.* (1879); Galbraith, *Wildflowers Vict.* ed. 2: t. 25 A (1955); Clark, *Wild Life* 10: 496 (1948); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Scammell in Rupp, *Orchids N.S.W.* t. 13 opp. 80 (1943); Garnet, *Wild Life* 1: 22 (Sept. 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 35 (1934); Pescott, *Orchids Vict.* t. inter 32 & 33 (1928); Rupp, *Aust. Nat.* 6: 61 (1927); Coleman, *Gum Tree* 5: 8 (Dec. 1920); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 17 (1911).

Vern.: Blunt Greenhood. *Distr.*: Widespread in cooler woodlands, grassy dells and shaded mountain gullies almost throughout Victoria, but absent from dry inland areas, alps and agricultural country, often locally abundant (e.g. in localities as scattered as Mt. Richmond near Portland, Grampians, Ararat, St. Arnaud, Mt. Beckworth, Gisborne, Brisbane Range, Otways, Dandenongs, Mt. Disappointment, Alexandra, Mt. Timbertop, Warby Range, Mitta Mitta, Cravensville, Wilson Prom. & Sunday Id, Orbost, Cann R., Genoa, Malla-coota); all States except W.A., but in Qd only the far south, also N. Cal.

—Points of lateral sepals *long* and acuminate, *exceeding* the galea; labellum *not* twisted, contracted at the apex, > 15 mm. long 31

31. Flower up to 3 cm. long; petals acuminate, *not* dilated; labellum \pm 16 mm. long, tapering *gradually*:

P. acuminata R. Br. [See No. 906].

—Flower > 3.5 cm. long (often much more); petals *dilated above*; labellum 20 mm. long or more, suddenly contracted at the apex (plant of East Gippsland):

926. *P. baptistii* R. D. FitzG. *Aust. Orchids* 1¹: + t. col. (1875).

Illust.: FitzGerald (*l.c.*); Mrs. Thiselton-Dyer in *Curtis's bot. Mag.* 104: t. 6351, col. (1878); Nicholls, *Vict. Nat.* 57: t. 15 (1940), also 44: 42 fig. d (1927); Nicholls in Barrett, *Sun Nature Book* n. 5: 30 fig. A, col. (1934); Rupp, *Guide Orchids N.S.W.* 102 (1930); *Gdnrs' Chron.* new ser. 9: 213 fig. 38 (1878).

Vern.: King Greenhood (Giant Greenhood). *Distr.*: Restricted in Victoria to a few colonies in far East Gippsland, on moist flats beside and near the Prince's Highway (Cann R., Genoa & Scrubby Cks, Maramingo Ck); also N.S.W. (widespread through the Coastal Division), Qd (south-east).

32. Cauline leaves *reduced* to sheathing bracts; a basal *rosette of leaves encircling the scape* (either green or more often withered at flowering time—spring to early summer); labellum-tip *entire* or almost so 34

—Cauline leaves *well-developed*; *no rosette of leaves* encircling base of scape (but radical leaves sometimes present on a *separate shoot*); labellum *bifid* at apex; flowering time winter to early spring 33

33. Leaves *narrow-lanceolate*; flowers almost *erect, green*; lower sepals *narrow* (2-3 mm. wide), with *acuminate apices*:

927. *P. longifolia* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1¹: t. col. (1875); Galbraith, *Wildflowers Vict.* ed. 2: t. 25 c (1955); Muir, *Vict. Nat.* 64: 151 (1947); Nicholls, *Vict. Nat.* 62: 63 fig. K-L (1945), also 43: 102 fig. 20 (1926); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 36 (1934); Rupp, *Proc. Linn. Soc. N.S.W.* 58: 425 fig. 7 (1933); Ewart, *Flor. Vict.* fig. 166 (1931); Rupp, *Aust. Nat.* 6: 61 (1927); Coleman, *Gum Tree* 5: 8 (Dec. 1920); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 63 fig. 2 (1914); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 14 (1911); FitzGerald in Darwin, *Various Contrivances Orchids Fertilised* popular ed. 87 fig. 14 (1904); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 117 fig. B, col. (1858).

Vern.: Tall Greenhood. *Distr.*: Except the Northern Mallee, Murray plains, alps, grasslands, farms and pastures, widespread throughout Victoria and often common, from coastal heath to dry or mountain-forest (e.g. such dispersed

areas as Lower Glenelg R., Portland, Grampians, Little & Big Deserts, Pyrenees, Bendigo, Daylesford, Brisbane Range, Otways, Arthur's Seat, Dandenongs, Heathcote, Rushworth, Mt. Buffalo, Upper Murray R., Wulgulmerang & Suggan Buggan, Howe Ranges, Orbost, Sale, Wilson Prom., Strzelecki Range); all States except W.A., but in Qd only the south.

[At Dimboola and Diapur in the Wimmera, Vic., occurs a small congested form of the species, never much more than 6" high and usually less; normally *P. longifolia* ranges in height from 6" to 3 ft., and particularly robust examples have been found at Creswick growing in the protection of clumps of Small Grass-tree (*Xanthorrhæa minor*).]

—Leaves *broad-lanceolate*; flowers conspicuously *nodding*, usually *reddish-brown* but coarsely *striped* with green and white; lower sepals very *broad* (5 mm. or more), with *short* acute points:

928. *P. vittata* Lindl. in Edwards' bot. Reg. 25: Swan Riv. Append. liii (1840).

Illust.: Erickson, *Orchids of the West* t. 13 fig. 16 (1951); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Garnet, *Wild Life* 1: 23 (July 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 37 (1934); Pelloe, *W. Aust. Orchids* t. opp. 64 fig. 14, col. (1930); Nicholls, *Vict. Nat.* 43: 102 fig. 21 (1926); Rupp, *Proc. Linn. Soc. N.S.W.* 50: 309 fig. 10 (1925); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 13 (1911).

Vern.: Banded Greenhood. *Distr.*: Very disjunct in shaded but well-drained sandy parts of far western and southern Victoria, on both coastal and Mallee heaths or in light forest, but mostly rare and apparently absent from East Gippsland (Portland district, Grampians, Little Desert, Wyperfeld Nat. Park, Brisbane Range, eastern Otways, Point Lonsdale, Arthur's Seat, eastern heathlands of Port Phillip Bay where perhaps now extinct, Wilson Prom. & Sunday Id); Tas. (Deal, Flinders & Clarke Is in Bass Strait), S.A., W.A. (widespread).

34. Flowers usually reddish, variable in size; lower sepals with acuminate to long-filiform tips; labellum-appendage small or obsolete 36

—Flowers *pale green*, small (<1 cm. long); all the segments very *short and blunt*; appendage at base of labellum conspicuous, almost *as long as the lamina* 35

35. Galea and column curving appreciably; labellum-appendage recurved and pointing outwards (toward labellum-tip); lower lobes of column-wings with densely ciliate margins; stigma ± narrow, situated midway on column:

929. *P. cynocephala* R. D. FitzG. Aust. Orchids 1²: + t. col. (1876).

Illust.: FitzGerald (*l.c.*); Garnet, *Wild Life* 1: 13 (Sept. 1939); Nicholls in Barrett, *Sun Nature Book* n. 5: 37 (1934); Nicholls, *Vict. Nat.* 43: 71 fig. 2 (1926); Irwin in Hatch, *Trans. roy. Soc. N.Z.* 80: t. 73 (1953).

Vern.: Swan Greenhood. *Distr.*: Except for coastal heaths, heavier forests, the Far North-west, lowland areas in East Gippsland, agricultural tracts and settlements, scattered through most other parts of Victoria, favouring dry or stony places in light forest or on grassland at low elevations but moist grassy slopes in the alps where sometimes locally abundant (e.g. in localities as dispersed as Bridgewater near Portland, Grampians, Dimboola, Diapur, Serviceton, Lake Albacutya, Birchip, St. Arnaud, Ararat, Maryborough, Whipstick Scrub near

Bendigo, Heathcote, Graytown & Rushworth, Keilor basalt plains where now rare, Mt. Disappointment, Alexandra, Nathalia, Myrtleford, Cravensville, Bogong High Plains, Cobungra, Cobboras, Suggan Buggan, Nunniong Plateau, Howitt Plains); S.A. (Monarto South, Cherry Gardens), Tas. (Flinders Id, St. Helens, Epping, Campbelltown), N.S.W. (widely ranging but sparse), N.Z. (rare—Canterbury Province at Mt. Torlesse).

—Galea and column \pm erect; labellum-appendage almost straight and pointing inwards; column-wings with only sparsely ciliate margins; stigma \pm cordate, high up on the column:

930. *P. mutica* R. Br. *Prodr. Flor. Nov. Holl.* 328 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1²: t. col. (1876); Erickson, *Orchids of the West* t. 14 fig. 15 (1951); Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 37 (1934); Nicholls, *Vict. Nat.* 43: 71 fig. 1 (1926); Rupp, *Aust. Nat.* 6: 61 (1927); Fiveash in Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 16 (1911); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 117 fig. A, col. (1858); Irwin in Hatch, *Trans. roy. Soc. N.Z.* 80: t. 74 (1953), also 77: t. 19 fig. 3 & K (1949).

Vern.: Midget Greenhood. *Dist.*: Ranging less continuously in Victoria than *P. cynnocephala* and apparently much less frequent, occurring largely in dry places north of the Dividing Range and very rare in the alps (Grampians, Dimboola, Little & Big Deserts, Wyperfeld Nat. Park, Kulkyne Nat. Forest & Far North-west, Richardson R., Hawkesdale, Beaufort district, Whipstick Scrub near Bendigo, Werribee & near Tottenham where now facing extinction, Rushworth, Buttercup Ck near Mansfield, Benalla, Warby Range, Mt. Hotham, Upper Murray R., Wulgulmerang, Sperm Whale Head, Sale); all States, but in Qd only the south-east, also N.Z. (widely dispersed but rare).

36. Lower sepals 4-8 cm. long, filiform for $\frac{2}{3}$ of their length (very rare spectacular plant of north-eastern Victoria):

931. *P. woollsi* R. D. FitzG. *Aust. Orchids* 1²: + t col. (1876).

Illust.: FitzGerald (l.c.); Nicholls in Barrett, *Sun Nature Book* n. 5: 30 fig. D, col. (1934); Nicholls, *Vict. Nat.* 45: t. 8 (1928).

Vern.: Long-tail Greenhood. *Dist.*: Extremely localized and rare in Victoria where known by only a single collection from near Rushworth (Nov. 1928), on exposed ground in light box-ironbark forest; also N.S.W. (scattered on tablelands and Western Slopes where rare), Qd (extreme south).

—Lower sepals never > 4 cm. long, their filiform tips < 2 cm. long 37

37. Galea \pm 1 cm. long; lateral sepals acuminate only, without caudiform apices (except in the rare variety *aciculiformis*); labellum-lamina 2-2.5 mm. long, very obtuse; column \pm 6 mm. long:

932. *P. pusilla* R. S. Rogers in *Trans. roy. Soc. S. Aust.* 42: 26, t. 3 (1918).

Illust.: Fiveash in Rogers (l.c.); FitzGerald, *Aust. Orchids* 1²: t. col. (1880), as "*P. mitchellii*"; Erickson, *Orchids of the West* t. 14 fig. 14 (1951); Nicholls, *Vict. Nat.* 52: 168 fig. D-F (1936), as "*var. aciculiformis*", also 43: 106 fig. 26 (1926); Nicholls in Barrett, *Sun Nature Book* n. 5: 37 (1934); Rupp, *Proc. Linn. Soc. N.S.W.* 58: 425 fig. 3 (1933), also 56: 135 fig. 2 (1931)—both as "*var. prominens*"; Green, *Vict. Nat.* 42: t. 5 fig. 4 (1925); Archer & Fitch in Hooker f., *Flor. Tasm.* 2: t. 116 fig. B, col. (1858), as "*P. rufa*".

Vern.: Ruddy-hood. *Distr.*: Scattered in Victoria through open forest and woodland from the far west (Little Desert) to far east (Suggan Buggan), on poor or stony ground and frequent only in drier box forests (e.g. Dimboola, Ararat, Bendigo, Rushworth, near Yandoit, Creswick where very rare, Gisborne, Coimadai & Lerderderg Gorge, Brisbane Range, Kinglake, Hurst Bridge & Eltham, Doncaster & Mitcham where perhaps now extinct, Lower Fern-tree Gully, Beaconsfield, Woodside near Yarram, Sale district, Cann R., Suggan Buggan, Cravensville in far north-east); all States, but in Qd only the extreme south (Glen Aplin).

[The var. *aciculiformis* W. H. Nicholls in *Vict. Nat.* 52: 167 (1936) differs from typical *P. pusilla* in being wholly glaucous-green, the flowers (up to 10) much compressed laterally and with needle-like points to the lateral sepals; it is known only from Clydesdale near Newstead, Vic.]

—Galea 1-2 cm. long; lateral sepals tapering into caudiform points; labelum-lamina 3-8 mm. long; column > 8 mm. long 38

38. Stem-bracts few (2-6); labellum-lamina 5-8 mm. long, oblong, almost flat, with slightly upturned apex (widespread plant):

933. *P. rufa* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1²: t. col. (1876); Erickson, *Orchids of the West* t. 14 fig. 10 (1951); Nicholls, *Vict. Nat.* 66: 213 fig. D (1950), as "var. *despectans*"; Goldsack, *S. Aust. Nat.* 22³: 2 (June 1944); Nicholls in Barrett, *Sun Nature Book* n. 5: 37 (1934); Rupp, *Guide Orchids N.S.W.* 116 (1930), also *Proc. Linn. Soc. N.S.W.* 50: 309 fig. 8 (1925); Nicholls, *Vict. Nat.* 43: 106 fig. 25 (1926); Green, *Vict. Nat.* 42: t. 5 fig. 3 (1925); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 38: t. 15 (1914); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 12 (1911).

Vern.: Rusty-hood (Rufous Greenhood). *Distr.*: Except for the far north-east, sparsely scattered through savannah, woodland and open drier forest in northern and central Victoria, usually amongst box eucalypts or mallees and uncommon to rare (e.g. Kulkyn Nat. Park & Far North-west, Nhill, Little Desert, Dimboola & Horsham, Grampians, St. Arnaud, Maryborough, Bendigo & Epsom, Graytown, Gunbower Id, Echuca & Nathalia, Gisborne, Coimadai, Warrandyte, Benalla, Warby Range, Chiltern, Beechworth), with an isolated record for Sale in Gippsland; all States except Tas., chiefly in inland regions.

[The var. *despectans* W. H. Nicholls in *Vict. Nat.* 66: 215 (1950) differs from other forms of *P. rufa* in its low stature (rarely exceeding 6-7 cm.), paler smaller flowers and deflexed pedicels (the sepals often actually touching the ground); it is known only from the Maryborough district, Vic. (Nov. 1947).]

—Stem-bracts few; labellum-lamina 3-4 mm. long, slipper-shaped and hollowed, with depressed apex (rare plant of west and north-east):

934. *P. mitchellii* Lindl. in Mitch. *J. Exped. trop. Aust.* 365 (1848).

Illust.: Erickson, *Orchids of the West* t. 14 fig. 12 (1951); Rupp, *Aust. Orchid Rev.* 10: 19 (Mar. 1945); Garnet, *Wild Life* 5: 329 (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 35 (1934); Nicholls, *Vict. Nat.* 43: 106 fig. 27 (1926); Rupp, *Proc. Linn. Soc. N.S.W.* 50: 309 fig. 9 (1925); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 38: t. 15 (1914).

Vern.: Mitchell Greenhood (Sikh's Whiskers). *Distr.*: Known in Victoria only from a few isolated northern districts, in dry box forest or mallee scrub and rare (Kiata between Nhill and Dimboola, Kewell between Dimboola and Minyip, northern Grampians, Whipstick Scrub near Bendigo, Rushworth, Beechworth); all States except Tas., but everywhere localized and seldom collected.

—Stem-bracts *numerous* and close together, almost covering the scape; labellum-lamina \pm 5 mm. long, *lanceolate*, often emarginate and *upturned* at apex (very rare north-western and north-eastern plant):

935. *P. squamata* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Illustr.: FitzGerald, *Aust. Orchids* 1⁶: t. col. (1880); Erickson, *Orchids of the West* t. 13 fig. 11 (1951); Scammell in Rupp, *Orchids N.S.W.* t. 17 opp. 96 (1943); Nicholls, *Vict. Nat.* 58: 116 fig. A-E (1941), also 53: 136 (1936) and 43: 106 fig. 28 (1926); Nicholls in Barrett, *Sun Nature Book* n. 5: 39 (1934); Rupp, *Proc. Linn. Soc. N.S.W.* 50: 309 fig. 7 (1925); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 38: t. 15 (1914).

Vern.: Scaly Greenhood. *Distr.*: Very localized and rare in Victoria where known from only three widely separated northern localities (4 miles south from Rainbow, Maldon district, Beechworth); N.S.W. (Barraba, Cobar), ?Tas. (Smithton), S.A. (Enfield, Port Lincoln), W.A. (Cranbrook, Kumarl)—everywhere localized and very infrequent.

[The var. *valida* W. H. Nicholls in *Vict. Nat.* 58: 115 (1941) differs from typical *P. squamata* in being *wholly green*, with robust scapes about 6" high and *longer* (2 cm.) sepal-points which are *not* hooked inwards but almost parallel; it is known only from Mt. Tarrengower near Maldon, Vic. (Oct. 1941).]

280. *GASTRODIA* R. Br. (1810)

936. *G. sesamoides* R. Br. *Prodr. Flor. Nov. Holl.* 330 (1810).

Illustr.: FitzGerald, *Aust. Orchids* 2⁵: t. col. (1894); Nicholls in Blackmore, *Vict. Nat.* 77: 47 (1960); Erickson, *Orchids of the West* t. 30 opp. 92, col. (1951); Curtis, *Wild Life* 2: 21 (Nov. 1940); Nicholls in Barrett, *Sun Nature Book* n. 5: 12 (1934); Rupp, *Guide Orchids N.S.W.* 54 (1930); Dickins, *Vict. Orchids* 2 fig. 2 (1929); Pescott, *Orchids Vict.* t. inter 32 & 33 (1928); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 57 fig. 2 (1914); Rodway, *Some Wild Flowers Tasm.* t. on 117 (1910); Archer in Hooker f., *Flor. Tasm.* 2: t. 126, col. (1858); Hatch, *Trans. roy. Soc. N.Z.* 77: t. 16 fig. 2 (1949); Barker, *J. S. Afr. Bot.* 15: 114 (1949); Bauer in Endlicher, *Icon. Gen. Plant.* t. 5 (1838).

Vern.: Cinnamon Bells (Potato Orchid, Native Potato—Tas.). *Distr.*: Woodlands and forests throughout cooler, moister parts of Victoria from sea-level to the sub-alps, tolerating a wide range of soils, but usually in small very scattered colonies and uncommon (e.g. Lower Glenelg R., Portland district, Grampians, Mt. Cole, Trentham, Otways, Arthur's Seat, Kinglake Nat. Park, Dandenongs, Healesville & Marysville, Aberfeldy-Matlock region, Upper Macallister R., Mt. Timbertop, Mt. Buffalo, Barry Mtns., Bogong High Plains, Upper Murray R., Moe, Wilson Prom., Deadcock Ck gorge, Orbost district, Combienbar, Bendoc, and scattered through much mountain country of East Gippsland); all States, but in W.A. only Karri forest of the far south-west and in Qd confined to the south-east, also N.Z. (North Id) and S. Afr. (where first noted as an accidental introduction from Australia at Kirstenbosch near Cape Town in 1944).

Diagn.: Leafless saprophyte with extensive underground, tuberous rhizomes resembling small Jerusalem artichokes (*Helianthus tuberosus*); flowering-stems appearing Oct.-Jan., single or several, 1-3 ft. high, stout (up to 10 mm. thick), rigidly erect, greenish to dark nigger-brown, with 3 to several remote, thin, appressed, very broad, \pm truncate bracts 4-8 mm. long (passing into smaller floral bracts); flowers 3-20 (rarely more), brown externally, white or creamy within, \pm pendulous in a loose terminal raceme to 6" long, their pedicels 3-6 mm. long; 3 sepals and 2 petals subequal, all united into a 5-lobed, bell-like tube 10-16 mm. long and 4-8 mm. wide, the base ventricose and gibbous, the 5 paler spreading lobes very short (2-3 mm. long and broad); labellum 8-12 mm. long, oblong, very obtuse, whitish toward the dilated claw (2-3 mm. long) but yellow or orange distally, the very undulate margins irregularly lacerated, the lamina bearing a single longitudinal ridge bordered with numerous calli and terminating in a multiple yellow gland at apex; column elongated, \pm 10 mm. long, very narrowly winged; anther shortly stalked, lid-like, \pm 1.5 mm. diam.; ovary shortly obconic, 4-6 \times 3-4 mm.

[The endoparasitism of *G. sesamoides* is discussed in detail (with references) by Ethel I. McLennan in *Aust. J. Bot.* 7: 225-229, tt. 1-4 (Dec. 1959).]

281. SPIRANTHES L. C. Rich. (1818)

937. *S. sinensis* (Pers.) Ames *Orchidaceæ* 2: 53, (1908).

Neottia sinensis Pers. *Synops. Plant.* 2: 511 (1807);

S. australis (R. Br., ut *Neottia* sp.) Lindl. in *Edwards' bot. Reg.* 10: sub t. 823 (1824).

[The change to *S. lancea*, published in *Blumea* 6: 361 (1950), was proved erroneous by J. Vuijk in *Blumea* 11: 226-228 (1961).]

Illust.: FitzGerald, *Aust. Orchids* 1²: t. col. (1876), as "*S. australis*"; Chisholm in Rupp, *Aust. Encycl.* 6: 412 A (1958); Forster in Harris, *Wild Flowers Aust.* t. 48, col. (1947); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 301 A (1943); Nicholls in Barrett, *Sun Nature Book* n. 5: 27 fig. A, col. (1934); Coleman, *Vict. Nat.* 56: t. 2 (1939), also 50: 62 (1933); Coleman, *Vict. Nat.* 47: 208 & t. 3 (1931), as "*S. australis*"; Dickens, *Vict. Orchids* 2 fig. 1 (1929), as "*S. australis*"; Pescott, *Orchids Vict.* t. opp. 48 (1928), as "*S. australis*"; Fiveash in Rogers, *Introd. Study Orchids S. Aust.* ed. 2: 26 (1911), as "*S. australis*"; Hatch, *Trans. roy. Soc. N.Z.* 79: t. 73 fig. 1 (1952); Pantling, *Ann. R. bot. Gdn Calcutta* 8: t. 369, col. (1898), as "*S. australis*"; Govindoo in Wight, *Icon. Plant. Orient.* 5: t. 1724 (1851), as "*S. australis*"; Reichenbach f., *Icon. Flor. germ.* 14: t. 476, col. (1851), as "*S. australis*"—all illustrations not cited as "*S. australis*" appear over "*S. sinensis*".

Vern.: Austral Ladies' Tresses. *Distr.*: Scattered through cooler parts of Victoria from Portland district to the Upper Murray R., always on swampy ground or inundated stream-banks and sometimes locally abundant amongst rushes and sedges (e.g. Casterton, Condah Swamp, Hawkesdale, Grampians, Creswick where rare, Woori Yallock Ck at Parslow's Bridge, Healesville & Warburton, Narbethong, Upper Jamieson R., Euroa-Gooram district, Mt. Buller, Ovens R., Mitta Mitta R. & Snowy Ck, Towong, Morass Ck near Benambra, Lardner near Drouin, Snake Id, Snowy R., Brodribb R., Bidwell on Upper Delegate R., Bendoc); all States except W.A., but only the south-east of both S.A. & Qd, N.Z., extending to Indonesia, Philippines, Japan, China, Indo-China, Malaya, Ceylon, Himalayas to 8000 ft., Afghanistan, Siberia—perhaps the most widely ranging orchid in the world, flowering Dec.-Mar. in Vic.

Diagn.: Slender marsh-plant with several elongated subterranean tubers; leaves radical, 3 or more, glabrous, narrow- to broad-linear, 2-4" long, to 10 mm. wide; flowering-stem erect or sometimes \pm flexuose, 6-12" high or more, \pm 2 mm. diam., bearing 2-3 appressed bracts; flowers sweetly fragrant (as in Solomon's Seal), sessile, overlapping, numerous (usually 20 or more), \pm deflexed, arranged in about 3 complete spirals around the terminal spike (2-4" long), each flower embraced by a green ovate-lanceolate, glandular-pubescent bract 5-10 mm. long; 3 sepals and 2 petals bright rosy-pink, subequal, 4.5-6 mm. long, \pm oblanceolate, connivent (only the tips slightly spreading), glandular-hairy at extreme base and on ovary, glistening-papillose in upper parts, the dorsal sepal and petals adhering for the greater part to form a shallow hood over column; labellum glistening-white, sessile, 4-5 mm. long, oblong-elliptic to obovate when flattened out, but appearing slipper-like from the much incurved, distally fimbriate-crispate margins, the lamina glabrous and with 2 small ovoid glands at base; column 2-3 mm. high, with 2 broad lacinate lateral lobes formed from the large U-shaped stigma and lip of rostellum; anther stalked, apiculate, \pm 1 mm. long; ovary gibbous, 3-4 mm. long, glandular, partly hidden by floral bract.

282. DENDROBIUM Swartz (1799)

Leaves thick and leathery, *flat, ovate* to broadly elliptic, 3-10" long; flowers numerous on a *stout raceme*, each \pm 1" long, creamy or pale yellow, *without stripes*; mid-lobe of labellum *entire*, \pm dotted with purple:

938. *D. speciosum* Sm. *Exot. Bot.* 1: 17, t. 10 (1804-05).

Illustr.: Smith (*l.c.*); Hooker in *Curtis's bot. Mag.* 58: t. 3074, col. (1831); Fitzgerald, *Aust. Orchids* 2⁴: t. col. (1891); Chisholm in Rupp, *Aust. Encycl.* 6: 412 p (1958); Elton, *Aust. Orchid Rev.* 18²: cover (June 1953); Goss, *Wild Life* 10: 113 (1948); Chisholm, *Wild Life* 9: 259 (1947); Curtis, *Vict. Nat.* 64: t. 9 (1947); Reeves, *Wild Life* 4: 301 (1942), also Garnet *l.c.* 4: 405 (1942); Hamilton in Douglas, *Aust. Orchid Rev.* 2¹: 7 (Mar. 1937), also Burns *l.c.* 3²: 47 (June 1938); Nicholls in Barrett, *Sun Nature Book* n. 5: 4 (1934); Pescott, *Orchids Vict.* t. opp. 16 (1928); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 56 (1914); Maiden, *Native Flowers N.S.W.* [t. 10] (1911); *Gdnrs' Chron.* ser. 3, 65: 155 (1919); *Orchid Rev.* 24: frontisp. (1916); Drake in *Edwards' bot. Reg.* 19: t. 1610, col. (1833).

Vern.: Rock Orchid (Rock Lily, King Orchid). *Distr.*: Restricted in Victoria to a few localities in far East Gippsland but locally abundant there, colonizing granite or occasionally sandstone rock-outcrops and sometimes perching on cliff-faces (Upper Genoa R. near N.S.W. border, Genoa R. gorge to Genoa Peak, Howe Ranges, with reported occurrences also at Wingan Inlet and Buldah Ck in Upper Cann R. region); N.S.W., Qd (as far north as Cairns district).

Leaves *cylindrical, narrow*, 2-5" long, \pm curved and pendulous; flowers either *solitary* or 2 together on *wiry peduncles*, each <1" long (usually 1-1.5 cm.), each cream sepal with 3-5 prominent *dark reddish striæ*; mid-lobe of labellum *prominently crisped*, clear white, recurved:

939. *D. striolatum* Reichenb. f. in *Hamb. Gtn-Blumen Z.* 13: 313 (1857).

Illustr.: Reeves, *Wild Life* 4: 404 (1942), also 1: 20 (Oct. 1938) and *Vict. Nat.* 54: t. 14 (1938); Overall, *Aust. Orchid Rev.* 4²: 53 (1939); Nicholls in Barrett, *Sun*

Nature Book n. 5: 7 (1934); Rupp, *Guide Orchids N.S.W.* 26 (1930); Sulman, *Some Familiar Wild Flowers* t. 47 (1913); Rodway, *Tasm. Flor.* t. opp. 184 (1903); Mueller, *Key Syst. Vict. Plant.* 2: fig. 112 (1886), also *Introd. bot. Teachings Schools Vict.* fig. LI (1877); Reichenbach f., *Xenia Orchidacea* 2: t. 109 fig. III & 6-8 (1862).

Vern.: Streaked Rock Orchid. **Distr.:** Confined in Victoria to East Gippsland, where locally plentiful in numerous isolated colonies on granite and porphyry rock-surfaces (Nowa Nowa, Buchan, Snowy R. and tributaries, Murrungowar, Erinundra R., Mt. Bungywarr, Tonghi Ck, Cann R., Mt. Kaye, Genoa Peak, Upper Genoa R., Howe Ranges, with ultimate westerly occurrences at Boggy Ck and Mitchell R. gorge area); Tas. (north-east granitic coast, Clarke Id, Cape Barren Id, Flinders Id), N.S.W. (as far north as Hunter R.).

283. DIPODIUM R. Br. (1810)

940. *D. punctatum* (Sm.) R. Br. *Prodr. Flor. Nov. Holl.* 331 (1810).

Dendrobium punctatum Sm. *Exot. Bot.* 1: 21, t. 12 (1804).

Illust.: Smith (l.c.); FitzGerald, *Aust. Orchids* 1st: t. col. (1882); Elford, *Wild Life* 16: 174 (1952); Forster in Harris, *Wild Flowers Aust.* t. 13, col. (1947); Rupp, *Aust. Orchid Rev.* 11: 33 (1946); Croll, *Wild Life* 8: 10 (1946); *Wild Life* 7th: 80 & cover col. (1945); Goldsack, *S. Aust. Nat.* 22nd: 9 (June 1944); Fiveash in Black, *Flor. S. Aust.* ed. 2: fig. 295 A (1943); Cruickshank, *Aust. Orchid Rev.* 5: 77 (1940); Reeves, *Wild Life* 1: 20 (Oct. 1938); Nicholls in Barrett, *Sun Nature Book* n. 1: 22-23 fig. 14, col. (1932), also n. 5: 11 (1934); Ewart, *Flor. Vict.* fig. 152 (1931); Dickins, *Vict. Orchids* 20 (1929); Pescott, *Orchids Vict.* t. opp. 33 (1928), also *Vict. Nat.* 43: t. 7 (1926); Mort in Sulman, *Wild Flowers N.S.W.* 2: t. 57 fig. 1 (1914); Fiveash in Rogers, *Trans. roy. Soc. S. Aust.* 37: t. 6 (1913); Rogers, *Introd. Study S. Aust. Orchids* ed. 2: 23 (1911); Archer in Hooker f., *Flor. Tasm.* 2: t. 127, col. (1858); Meredith, *Bush Friends Tasm.* t. 3, col. (1860); Drake in Edwards' *bot. Reg.* 23: t. 1980, col. (1837).

Vern.: Hyacinth Orchid (Spotted Orchid). **Distr.:** Widespread in Victorian forest-land wherever the annual rainfall exceeds 25", often on poor sandy or rocky soils and locally common, but neither at high altitudes nor in the shade of heavier forests or fern gullies (e.g. localities as dispersed as Lower Glenelg R., Portland, Grampians, Mts. Cole & Ben Nevis, Ballarat-Creswick & Wombat Forests, Brisbane Range, Otways, Arthur's Seat, Dandenongs, Healesville, Kinglake Nat. Park, foothills of Mts. Buller, Buffalo & Hotham, Snowy Ck, Mt. Gibbo Range, Walhalla, Wilson Prom., Orbost district, Wingan Inlet, Genoa Peak, Upper Delegate R.); all States except W.A., extending into tropical N. Aust. as the var. *stenocheilum* (O. Schwarz, ut sp.) H. M. R. Rupp.

Diagn.: Leafless saprophyte with extensive tuberous and intricate underground rooting-system; flowering-stems appearing in late summer and often frequent after bush-fires, single or several together, 1-3 ft. high (sometimes more), stout, 4-8 mm. thick, straight or sinuous, green to dark reddish-brown, bearing several distant, erect, triangular-ovate bracts (10-20 mm. long) that pass into the closer floral bracts above and into crowded scales below ground-level; buds erect, spotted, slightly gibbous at base; flowers relatively large, usually 20-40 in a narrowly pyramidal raceme 6-12" long, the spreading pedicels 10-14 mm. in length; 3 sepals and 2 petals similar, widely spreading, white or pale pink (rarely \pm yellowish), heavily flecked and spotted with reddish-purple (rarely unspotted), elliptic-lanceolate or narrowly oblong, with slightly recurved

pointed apices, 12-18 mm. long, 4-6 mm. wide; labellum also purple-dotted, oblanceolate to broadly spatulate, 12-15 mm. long, thickish, fused with column-foot and minutely gibbous at extreme base, 3-lobed, the 2 small forward-pointing lateral lobes linear and about 4.5×1 mm., the narrowly rhombic terminal lobe $8-12 \times 4-6$ mm.; lamina of labellum with strong keel on upper surface (dividing into 2 longitudinal ridges near base), densely bearded with short white or pinkish hairs toward apex which is \pm decurved and beak-like; column white, 6-8 mm. long, parallel with and appressed to labellum, subcylindric, very thick and rigid; anther lid-like, ± 1 mm. high and wide; stigma 1.5 mm. wide, close to anther yellowish, oval, the rostellum obscure; ovary narrowly obconic, $10-12 \times 2-3$ mm.

284. THRIXSPERMUM Lour. (1790)

941. *T. tridentatum* (Lindl.) T. E. Hunt in *Qd Nat.* 16: 27 (1958).

Cleisostoma tridentatum Lindl. in *Edwards' bot. Reg.* 24: Misc. 33 (1838).

Illust.: FitzGerald, *Aust. Orchids* 1⁵: t. col. (1879); Garnet, *Wild Life* 4: 406 (1942); Nicholls, *Vict. Nat.* 52: t. 27 fig. A-C (1936); Nicholls in Barrett, *Sun Nature Book* n. 5: 9 (1934); Rupp, *Guide Orchids N.S.W.* 44 (1930)—all as "*Cleisostoma tridentatum*".

Vern.: Tangle Orchid. *Dist.*: Restricted in Victoria to several heavy jungles of County Croajingalong on and east of the Snowy R., but locally plentiful on various trees (Pipeclay & Wibenduck Cks near Orbost, Arte R., Bemm R., Mt. Drummer, Swampy Ck near Genoa, Howe Range); also N.S.W., Qd (to far north).

Diagn.: Epiphyte with numerous long aerial roots, a few only of which are attached to host-tree; stems pendulous, elongated, up to 1 ft. long but usually shorter; leaves flat, \pm distichous, linear-lanceolate, sometimes \pm falcate, mostly 2-3" long, up to 10 mm. wide; racemes about as long as leaves, lateral, slender, with 3-10 small, fragrant, green and reddish-brown flowers subtended by triangular bracts 1-1.5 mm. long at bases of pedicels; 3 sepals oblong to broadly lanceolate, acutish, 4-5 mm. long, ± 1.5 mm. wide, the 2 petals slightly narrower; labellum creamy or whitish, 5-6 mm. long, the basal half forming a blunt, deflexed hollow spur 2-3 mm. long (orifice of spur almost closed by a substantial, downward-projecting, very ciliate callus on the anterior rim of pouch, i.e. from base of labellum mid-lobe), the distal half 3-lobed with 2 equal, spreading, falcate, acute lateral lobes ± 2 mm. long and a very short, obtuse, concave, sometimes dotted middle lobe; column 2-3 mm. high, the foot virtually absent; anther hooded, rostrate, 1-1.5 mm. long, the rostellum a deeply bifid tooth, each pair of the 4 pollinia on a long caudicle; ovary narrow, 3-6 mm. long, occupying most of the floral "pedicel".

285. SARCOCHILUS R. Br. (1810)

Leaves almost straight; sepals and petals greenish-brown, broad-linear to narrowly oblanceolate, the latter erect; labellum white or yellowish, irregularly blotched and streaked with purple (capsule at maturity 1-1.5" long, 3-4 mm. wide, \pm cylindrical):

942. *S. australis* (Lindl.) Reichenb. f. in Walp. *Ann. Bot. syst.* 6: 501 (1861).
Gunnia australis Lindl. in *Edwards' bot. Reg.* 20: sub t. 1699 (1834);

S. parviflorus Lindl. in *Edwards' bot. Reg.* 24: Misc. 34 (1838).

Illust.: FitzGerald, *Aust. Orchids* 1³: t. col. (1877); Clark, *Wild Life* 7: 360 (1945), as "*S. falcatus*"; Scammell in Rupp, *Orchids N.S.W.* t. 23 opp. 134 (1943), as "*S. australis*"; Nicholls in Barrett, *Sun Nature Book* n. 5: 9 (1934); Dickins, *Vict. Orchids* 32 fig. 56 (1929); Nicholls, *Vict. Nat.* 45: t. 6 fig. 2, 5, 8 (1928); Rodway, *Some Wild Flowers Tasm.* t. on 107 (1910), also *Tasm. Flor.* t. opp. 185 (1903); Fitch in Hooker f., *Flor. Tasm.* 2: t. 128, col. (1858), as "*Gunnia australis*"—all, except Clark, Scammell and Fitch, over "*S. parviflorus*".

Vern.: Gunn's Orchid (Butterfly Orchid, Small Sarcophilus). *Distr.*: Scattered through fern gullies and jungles in the wetter sclerophyll forests of eastern Victoria, on mossy limbs of *Hedycarya*, *Tristania*, *Coprosma quadrifida*, *Bedfordia*, *Olearia argophylla* etc., and sometimes locally common (Dandenongs, Upper Bunyip R. at Beenak, Strzelecki Ranges, Mitchell R. gorge area, Orbost district, Upper Combienbar R., Cann R.), with isolated western occurrences in southern Otways; Tas. (including Flinders & Cape Barren Is), N.S.W., Qd (rare—south-east).

—Leaves \pm *falcate*; sepals and petals white, broadly ovate-oblong to almost oblanceolate, the latter *spreading* (forming with other segments a \pm rotate perianth); labellum white, stained inside with orange and traversed by dark red striæ (rare plant of far East Gippsland, the flowers very fragrant):

943. *S. falcatus* R. Br. *Prodr. Flor. Nov. Holl.* 332 (1810).

Illust.: FitzGerald, *Aust. Orchids* 1⁵: t. col. (1879); Reeves in Galbraith, *Wild-flowers Vict.* t. 17 (1950), also Reeves in *Wild Life* 13: 457 (1951), 4: 301 & cover, col., p. 401 (1942), 1: 20 (Oct. 1938) and *Vict. Nat.* 54: t. 13 (1938); Reeves in Rupp, *Aust. Orchid Rev.* 16: 84 (1951); Forster in Harris, *Wild Flowers Aust.* t. 58, col. (1947); Chisholm, *Vict. Nat.* 64: t. 9 (1947), also *Wild Life* 9: 261 (1947); Garnet, *Wild Life* 4: 406 (1942); Nicholls in Barrett, *Sun Nature Book* n. 1: 22-23 fig. 4, col. (1932), also n. 5: 9 (1934); Rupp, *Guide Orchids N.S.W.* 38 (1930); Nicholls, *Vict. Nat.* 45: t. 6 fig. 1, 7, 13 (1928); Pescott, *Orchids Vict.* t. opp. 17 (1928), as "*S. parviflorus*"; Geissmann, *Qd Nat.* 3: 54 (1922); Leaney, *Aust. Plant.* 1⁶: 24, col. (Mar. 1961); Drake in *Edwards' bot. Reg.* 22: t. 1832, col. (1836).

Vern.: Orange-blossom Orchid (Snowy Sarcophilus). *Distr.*: Confined in Victoria to jungle gullies of East Gippsland where extremely localized and rare (Cann R. at Noorinbee where perhaps now extinct, eastern watershed of Howe Range growing on *Eucryphia moorei* etc.); also N.S.W., Qd (chiefly southern ranges).

ADDENDA AND SUPPLEMENTARY NOTES

Information on the occurrence in Victoria of the following species arrived too late for their incorporation in the body of this handbook:

Page 29

After 50. *Grammitis billardieri*, insert *G. armstrongii* M. D. Tindale in *Contr. N.S.W. Herb.* 3: 88 (1961). Compact matted fern of alpine rock-crevices; rhizome long-creeping, branched; fronds \pm oblanceolate, 1-3.5 cm. long, 2-5 mm. wide; sori soon coalescing into a rounded mass at apical portion of lamina; equatorial diameter of spores 49-56 mic. This fern had been confused with small examples of *G. billardieri* from exposed situations at higher altitudes, but the latter may always be distinguished thus: *tufted or shortly creeping* rhizomes, rows of sori seldom confluent, equatorial diameter of spores only 20-40 mic. *G. pumila* Armstrong 1881 (*non* Swartz 1806) is synonymous.

In Victoria *G. armstrongii* is known only from Mts. Hotham and Bogong above 5500 ft., extending to the Kosciusko region of N.S.W., mountain summits of Tas., N.Z., Macquarie & Kerguelen Is.

Page 162

After 326. *Eragrostis cilianensis*, insert *E. curvula* (Schrad., *ut Poa*) Nees *Flor. Afr. aust.* 397 (1841), African or Weeping Love-grass. Tufted perennial with flowering culms 2-5 ft. high; leaf-blades to 1 ft. long, involute-filiform, \pm flexed; panicle 4-12" long, loose, \pm pyramidal with erect or spreading branches in pseudo-whorls; spikelets shortly pedicellate, olive-greyish, linear-oblong, 6- to 12-flowered, 5-10 mm. long; lemmas \pm 2.5 mm. long, obtuse, prominently 3-nerved.

Indigenous to South Africa and tropical East Africa, this grass was mentioned (p. 162) as of casual occurrence between Drouin and Warragul in 1913. It was also sporadic in Melbourne during 1921-22, but has been noted recently (Dec. 1961) as well established on park-land at Springvale. *E. curvula* is grown for ornament in the United States where it also shows promise as a hardy useful cover for erosion control. In the Melbourne area it remains green late into the summer, when most other grasses have shrivelled. [For illustrations see Laurence in Chippindall *Grasses & Pastures S. Afr.* fig. 110 (1955), also Hitchcock *Manual Grasses U.S.* ed. 2: fig. 231 (1951).]

Page 196

After 416. *Digitaria sanguinalis*, insert *D. adscendens* (Humb. et al., *ut Panicum*) Henrard in *Blumea* 1: 92 (1934). Variable annual extremely close to *D. sanguinalis*, but differing in the spikelets \pm acuminate, upper

glume relatively longer ($\frac{1}{2}$ to $\frac{3}{4}$ the length of spikelet) and nerves on the back of sterile lemma *all quite smooth*.

J. W. Vickery in *Contr. N.S.W. Herb. Flor. Ser. n. 19*: 103 (1961) records this pantropic "Summer Grass" as an introduced weed in all mainland States; but its range in Victoria is at present unknown, through lack of adequate collecting and confusion with the ubiquitous, macroscopically almost indistinguishable *D. sanguinalis*.

Page 198

After 420. *Digitaria ammophila*, insert *D. diffusa* J. W. Vickery in *Contr. N.S.W. Herb. 3*: 84 (1961). Delicate, decumbent perennial rooting at the nodes; leaf-blades to 3" long, glabrous or sparsely pubescent; racemes few (2-7), slender, distant, 1-3" long, at length widely spreading; spikelets 1.5-2 mm. long, usually in remote pairs, pedicellate, extending to base of raceme; upper glume almost equalling spikelet, its 3 nerves usually separated by lines of soft, fine, appressed hairs; sterile lemma firm, 5-nerved, pubescent with lines of short, often purplish hairs along margins and between nerves.

This is the undescribed species from Coast to Western Slopes of New South Wales and also Walwa (only known Victorian locality), mentioned on p. 198 as having been confused with the Queensland *D. tenuissima* (Benth.) D. K. Hughes.

Page 239

After 522. *Schænus nitens*, insert *S. turbinatus* (R. Br., ut *Chaetospora*) Poir. in *Encycl. méth. Bot. Suppl. 2*: 251 (1811). Tufted perennial \pm 1 ft. high, with filiform, somewhat circinnate leaf-blades and terminal heads of many greyish spikelets, each head subtended by 3-5 long-subulate foliaceous bracts 1-3" long; nut 3-ribbed and rugose, shorter than the 6 ciliate hypogynous bristles.

Previously known only from eastern New South Wales and Tasmania, this sedge was found on sandy heath about 9 miles west of Anglesea in Nov. 1961.

Page 331

After 744. *Romulea rosea*, insert *Galaxia fugacissima* (L. f., ut *Ixia*) Druce in *Rep. bot. (Soc.) Exch. Cl. Manchr 1916*: 624 (1917). Small perennial with rough, rigidly fibrous tunics on the corms; leaves and floral bracts \pm terete, 1-3" long; flowers yellow, fugitive, sessile, emerging successively from a compact head at ground level; perianth-tube 2-3 cm. long, the obtuse lobes 1-2 cm. long and 3 stigmatic lobes fringed. The genus is closely related to *Romulea*, but differs in having non-pedunculate flowers, long perianth-tube and united staminal filaments.

This irid is indigenous to the Cape Peninsula, S. Afr., and was first noted in Victoria at White Hills, Bendigo, during 1955. Since then it has been found at several places near Huntly (where locally abundant on grassy flats), at Belvoir Park golf-links near Ravenswood and at Lyal on the Coliban R. No other Australian occurrences are known. [For illustrations in colour, see Edwards in *Curtis's bot. Mag.* 32: t. 1292 (1810), also Thwaites & Dixie in *Marloth Flor. S. Afr.* 4: t. 45 fig. f (1915)—both as "*G. graminea*".]

SUPPLEMENT TO SECOND EDITION

During the eight years since publication of this volume (in September 1962) several minor typographical inaccuracies and omissions have been detected, sundry species hitherto unrecorded for Victoria have been found to occur in the State, while much additional information has come to hand on the Victorian and interstate distribution of uncommon to rare ferns and monocotyledons. As a result of recent monographical studies by specialists in certain genera (e.g. *Typha*, *Scirpus*, *Cladium*, *Juncus* and *Pterostylis*) some radical changes in the delimitation of species and in their nomenclature must now be made. Coincidental with the reprinting of the present volume, it is desirable that *all* this information be gathered together as a supplement—its interpolation throughout the body of the book would have proved far too costly.

This final supplement lists, page by page and line by line, all the changes that appear necessary to date, while the name of every species concerned is alphabetically indexed at the end of the supplement. Lines involving any alteration are numbered downwards from the top of a page; but, when an alteration occurs towards the bottom of a page, lines are read upwards for convenience (e.g. "Page 21—Line 8 up", for a mis-spelling of *Pteridium*). In some instances, where only few or rather inadequate illustrations were available for citation, these have been complemented by reference to good, recent portraits in colour—especially the excellent plates in *Flowers and Plants of Victoria* by Cochrane, Fuhrer, Rotherham and Willis (Sept. 1968).

Page xi

Line 16. Omit the word "it" from beginning of line.

Page xii

Line 17. Delete "*Typha augustifolia* (Bulrush) and".

Page 12

Line 4 up (re *Sticherus*). After "Copeland." add:

In *Proc. roy. Soc. Vict.* new ser. 76: 153–62 (1963), Stella L. Thrower has relegated *Sticherus* to subgeneric rank (as subgenus *Mertensia*) under *Gleichenia*, making the new combination *G. lobata* (Wakefield) Thrower on p. 159. Apart from morphological differences, however, *Sticherus* has also a different chromosome number from *Gleichenia* sens. strict.

Page 13

Line 13 up (re *Sticherus lobatus*). Before "Wakefield" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 443, col. (1968);

Page 16

Line 6 (re *Mecodium*). After "Cumberland Gorge." add:
In *Contr. N.S.W. Herb. Flora Series* n. 201: 21 (1963), Mary D. Tindale re-assigns the taxon *Mecodium* to subgeneric rank under *Hymenophyllum*. If this view be accepted, the four species of *Mecodium* enumerated above must revert to *Hymenophyllum* (as they were first described).

Line 15 up (re *Macroglena caudata*). After "suppl. 3" insert: [t. 13].

Page 17

(re *Cyathea marcescens*). Delete lines 7 & 8 up (quoted in synonymy).

Page 20

Line 4 up (re *Hypolepis rugosula*). After "land)" insert: , with an isolated record from Reedy Lake near Kerang (Jan. 1963).

Page 21

Line 8 up. For "*Pteridium aquilium*" read *Pteridium aquilinum*.

Page 23

Lines 7-9 up (re *Lindsaya cuneata*). Change "only by . . . extinct there" to read: by only two collections from Wilson Prom., viz. head of Chinaman's Ck at $\pm 3\frac{1}{2}$ miles N.E. of Mt. Vereker (Oct. 1909 & Aug. 1962).

Page 27

Line 7 up (re *Cheilanthes tenuifolia*). After "Mallee" insert: where very localized (e.g. near a dam at Nowingi).

Page 30

Line 22 (re *Pyrrosia rupestris*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 464, col. (1968);.

Page 31

Line 1 (re *Microsorium diversifolium*). Before "Wakefield" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 449, col. (1968);.

Page 35

Line 10. For "*hookerianum*" read *hookeranum*.

Line 23 (re *Pleurosorus rutifolius*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 214, col. (1968);.

Page 41

Line 2 up. For "Bendoe" read Bendoc.

Page 42

Line 16 (re *Blechnum patersonii*). After "Ranges" insert: , Bogong district in N.E.

Page 43

Line 24. For "Mt. Schanck" read Cape Schanck.

Page 48

Line 10 (re *Azolla pinnata*). Before "Williamson" insert: Cochrane,

Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 274, col. (1968), as "*A. filiculoides*";.

Line 21 (re *Azolla filiculoides*). Before "Lee" insert: Matthews, *N.Z. J. Agric.* 106: 297, col. (1963), as "*A. rubra*".

Page 50

Line 16 (re *Lycopodium varium*). After "Otways" insert: , head of Sealers Ck at Wilson Prom.

Line 8 up (re *Lycopodium selago*). After "writers." add: Indonesian, Australian and New Zealand populations, hitherto referred to *Lycopodium selago*, were described as a new species *L. australianum* by W. Herter in *Bot. Jb.* 43, Beibl. n. 98: 42 (1909). In *Flora Europæa* 1: 3 (1964), W. Rothmaler assigns *L. selago* to a distinct genus *Huperzia* Bernh. (1829) by virtue of its ascending and regularly dichotomous stems with axillary sporangia.

Page 52

Line 1. Replace *L. carolinianum* L. . . by: *L. serpentinum* Kunze in Lehm. *Plant. Preiss.* 2: 108 (1846).

L. drummondii Spring in *Mém. Acad. R. Belg.* 24: 35 (1849);

L. carolinianum sens. auct. Aust., non certe *L. Spec. Plant.* 2: 1104 (1753).

Line 8 (re *Lycopodium serpentinum*). After "border" insert: , also a bog along upper Glenelg R. in Grampians. After "Port Arthur" insert: , Lyell Highway 5 miles W. of Franklin R., Sisters Ck, Rocky Cape, Penny & Martha Lavinia Lagoons on King Id, Flinders & Cape Barren Is. in Furneaux Group. Delete lines 12-18 inclusive ("There . . . group.").

Line 2 up (re *Selaginella uliginosa*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 63, col. (1968);.

Page 54

Line 18 (re *Psilotum nudum*). Before "Mitre Rock" insert: Mt. Arapiles,.

Page 58

Line 11 up (re *Callitris verrucosa*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 133, col. (1968);.

Line 5 up (re *C. verrucosa*). After "Victoria" add: ; interior of N.S.W., S.A. & W.A.

Page 62 (re TYPHA)

Replace line 11 (119. *T. angustifolia* . . .) and as far as the end of page by the following key to three species of *Typha*, adapted from that set out by B. G. Briggs & L. A. S. Johnson in *Contr. N.S.W. Herb.* 4: 59-60 (1968):

1. Female spikes dark reddish- or blackish-brown, without floral bracts; stigmas flat, fleshy, not acuminate; pollen shed as tetrads; leaves mostly 1-2 cm. wide:

**T. latifolia* L. *Spec. Plant.* 2: 971 (1753).

Vern.: Great Reedmace (Cats'-tail).

—Female spikes cinnamon to chestnut-brown, usually with minute bracts subtending individual florets; stigmas concave, not fleshy, \pm acuminate; pollen shed as single grains; leaves often < 1 cm. wide

2. Bracts of female inflorescence *numerous, broadly* spatulate, usually 4-8 cells in width (across lamina); stigmas linear; mature female spikes 0.5-2.0 cm. diam.; auricles absent from sheaths or present only on uppermost 1-2 leaves:

T. domingensis Pers. *Synops. Plant.* 2: 532 (1807).

T. angustifolia sens. Ewart *Flor. Vict.* 81 (1931) pro maj. part., *non strict.* L. (1753).

Vern.: Bulrush (Cumbungi).

—Bracts of female inflorescence *few or absent, narrowly* spatulate, usually 3-4 cells in width (across lamina); stigmas *narrowly obovate*; mature female spikes 1-3 cm. diam.; auricles present on sheaths of uppermost 2-4 leaves:

T. orientalis Presl in *K.-Böhm. Ges. Wiss. ser. 5, 6* (Epimeliæ bot.): 599 (1852).

T. muelleri Rohrbach in *Verh. bot. Ver. Brandenburg* 11: 67 (1869).

Vern.: Bulrush.

[In Ewart's *Flor. Vict.* 81 (1931) and Black's *Flor. S. Aust.* ed. 2: 45 (1943) the foregoing species were all merged under a wide circumscription of *T. angustifolia* L. which, in the strict sense, belongs to temperate parts of the northern hemisphere. Owing to the loose manner in which this name has been used here until quite recently, it is not possible yet to give reliable distributional data for each of the three taxa in Victoria. Indigenous *T. domingensis* and *T. orientalis* are both obviously widespread and frequent in lakes, dams, lagoons and by stream-sides in many parts of the State; but the introduced *T. latifolia* is not known with certainty beyond the Greater Melbourne and Creswick districts.]

Page 70

Line 19 (re *Lepilaena cylindrocarpa*). After "Körnicker" insert: ex Walp.

Page 71

Line 11 (re *Aponogeton distachyus*). After "(1943)" insert: ; Ewart, *Flor. Vict.* fig. 22 (1931).

Line 19 (re *A. distachyus*). Replace "and" by a comma, and after "Peterborough" insert: , Gisborne and Lower Ferntree Gully.

Line 3 up (re *Triglochin procera*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 266, col. (1968);

Page 72

Line 13 (re *Triglochin striata*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 193, col. (1968);

Line 4 up (re *Triglochin mucronata*). Before "S.A." insert: Tas. (Furneaux Group, Bass Strait),.

Page 74

After line 4 (and above ALISMATACEÆ) insert:

Family LILÆACEÆ

Lilæa scilloides (Poir., ut *Phalangium* sp.) Haum. in *Publ. Inst. Invest. geogr., B. Aires* 10: 26 (1925).

Vern.: Flowering Quillwort or Lilæa.

Tufted annual on wet soil or sometimes aquatic; leaves grass-like, terete, 2-14" long, with hyaline sheathing stipular bases; flowers of 3 kinds—sessile pistillate

flowers enclosed in pairs by the ensheathing leaf-base, short spikes of mixed staminate and perfect flowers terminating slender scapes almost as long as foliage; pistillate flowers consisting of a single angular-ovoid carpel and remarkable thread-like style (1-12" long) with terminal capitate and papillate stigma; perfect and staminate flowers of spike with single, bractiform, perianth-like lobe 1-3 mm. long, single sessile anther and (in perfect flowers) an ovary with style only 1-20 mm. long; fruits from perfect flowers bract-like, flattened and winged (4-6 mm. \times 2-3 mm.), those of basal pistillate flowers angled and often crowned with horns or hooks.

A very remarkable monotypic genus and family indigenous to western N. America and S. America. In Oct. 1961 spontaneous colonies of *Lilæa* were found extending for 20-30 yards along a watercourse between Laverton and the Altona "Golf Links Swamp", Vic.—apparently the only recorded introduction of this species within the Australian region.

[For illustration, see Pomeroy in Mason, *Flor. Marshes Calif.* fig. 42 (1957).]

Page 75

Line 10 up. Between *ELODEA and Michx. insert: L. C. Rich in.

Page 76

Delete lines 10-14 and replace by:

E. canadensis Michx. *Flor. Bor.-Amer. 1*: 20 (1803).

Vern.: Canadian Pondweed. *Distr.*: Widespread submerged aquatic, in ponds, lakes, reservoirs, river shallows etc. (e.g. at Crawford River, Lake Colac, Romsey, Melbourne district where a pest in Albert Park Lake from 1960, Koo-Wee-Rup, Goulburn Valley in Nathalia and Cobram districts, Murray R. between Yarrowonga and Echuca).

[For illustrations, see Pomeroy in Mason, *Flor. Marshes Calif.* fig. 53 e-g (1957); also Fassett's *Manual Aquatic Plants* 97 fig. 70-73 (1960), as *Anacharis canadensis*. This North American plant is sometimes cultivated in aquarium tanks; it has . . .

Line 3 up (re *Ottelia ovalifolia*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 271, col. (1968);

Page 77

Line 12 up (re *Vallisneria spiralis*). After "United States" add:

In his *Supplement to J. M. Black's Flora of South Australia* (ed. 2): 41 (1965), Hj. Eichler has taken up the name *V. gigantea* Graebn. (1912) for the S.E. Asiatic and Australian plant which is said to differ from European *V. spiralis* in the faintly dentate, broader (1-2 cm.) leaves with more numerous veins (5-9), obtuse sepals and fringeless styles.

Page 85

(section 66 of key to GRAMINEÆ). Transpose figure 10 and sign >.

Page 90

Line 3 (re *Ehrharta calycina*). After "Wail, etc.," add: , also Wilson Prom. (on batters along tourist road in Yanakie area).

Line 19 (re *Microlaena stipoides*). After "Mem. Bishop Mus." amend the volume, page and date of illustration as follows: 8³: 861 (1922).

Page 91

Line 16 (re *Tetrarrhena*). After "Mt. Bogong" insert: , also in the Gram-pians,. Replace "alpine" in same line by: chiefly subalpine.

Page 93

Line 15 up (re *Puccinellia fasciculata*). After "Yarra R. (Vic.)" insert: , also from Toolleen near Heathcote (Nov. 1967).

Page 94

Last line (re *Desmazeria acutiflora*). After "Hamilton" add: Lara, Cowes on Phillip Id.

Page 96

Line 6 up (re *Poa tenera*). After "(l.c.)" add: ; Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 450, col. (1968).

Page 102

Line 5 (re *Festuca asperula*). After "Armidale)" add: , Tas.

Line 9 up (re *Festuca dives*). After "Suggan Buggan)" insert: , with a very isolated western occurrence on the Major Mitchell Plateau (Grampians) at ± 3500 ft. alt.;.

Last line (re *Festuca dives*). After "grain)." add:
In *Contr. N.S.W. Herb.* 3⁴: 195-96 (1963) Dr. Joyce W. Vickery establishes a new monotypic genus, *Dryopoa*, and makes the new combination *D. dives* (F. Muell.) Vickery for this impressive species.

Page 103

Line 7. For "hookeriana" read hookerana.

Page 104

Line 4 up (re *Vulpia membranacea*). After "(Sept. 1959)" add: and Cowes on Phillip Id (Nov. 1962).

Page 108

Lines 9 & 10 up (re *Cynosurus echinatus*). Alter the list of localities to read (Hamilton, Camperdown & Colac, Creswick & Daylesford, Melbourne, Dandenongs, Yea, Phillip Id, Traralgon, Lakes Entrance, Wulgulmerang etc.).

Page 109

Line 8 (re *Cynosurus cristatus*). After "Dandenongs" add: , Narracan district where widespread in pastures.

Page 110

Line 19 (re *Glyceria fluitans*). After "Commonwealth." add:
Undoubted occurrences have been noted during the past decade at Macedon, Vic. (Sept. 1964), St. Albans, Vic. (Oct. 1966), Strathbogie Ranges, Vic. (Dec. 1968), Khancoban, N.S.W. (Dec. 1968) and Flinders Id, Tas. (May 1966).

Line 22. After "2-3" insert: mm.

Lines 10 & 11 up (re *Glyceria maxima*). After "Qd" insert: , Tas. (King Id). After "Noojee," insert: Narracan-Thorpdale area in which now aggressive along many streams,.

Page 111

Line 8 (re *Bromus unioloides*). Delete "(Willd.)".

Between lines 18 & 19 up insert:

B. stamineus E. Desv. in C. Gay *Hist. fis. pol. Chile (Flor. Chile)* 6: 440 (1854).

Close to *B. unioides*, from which it differs in its more spreading glumes with distinct awns ± 5 mm. long, this Chilean grass has become naturalized on the Calder Highway between Malmsbury & Taradale (Aug. 1962), at Eaglehawk (Nov. 1964), Deer Park (July 1964), Narbethong (Nov. 1964) and Camperdown (May 1965).

Line 36 (re *Bromus cecadilla*). After "naturalized in" insert: Tasmania and.

Page 113

Line 9 (in key to *Bromus* spp.). After "2 cm." add: ; anthers shortly oblong, <1 mm. long.

Page 117

Line 18 up (re *Agropyron junceum*). After "A. junceum." add:

In Feb. 1962 the European Sea Couch-grass, *A. pungens* (Pers., ut *Triticum* sp.) Roem. & Schult. *Syst. Veg.* 2: 753 (1817), was noted as spontaneous on a small area at Point Henry, Corio Bay. This tufted, often glaucous, long-rhizomic perennial (1-3 ft.) differs from *A. junceum* in its sharply pointed leaf-blades with *glabrous ribs*, \pm serrate margins to the rachis of the spike, and glumes having only 5-7 nerves. It is naturalized near Christchurch (N.Z.), also at a few localities in the U.S.A. Hybrids with the often co-extensive *A. junceiforme* are recorded from coastal dunes in the British Isles.

Page 120

Line 8 up (re *Hordeum murinum*). After "central one." add: Samples were collected at Cook on the Transcontinental Railway, S.A. (Sept. 1963).

Page 121

Line 11 (re *Hordeum marinum*). After "South Australia," delete the remainder of sentence and replace by:

It should now be placed on the list of grasses naturalized in Victoria, having appeared in some quantity during the past decade at Port Melbourne (Oct. 1964), Reservoir (Dec. 1966), Bacchus Marsh road near Geelong (Oct. 1963), Lake Goldsmith near Beaufort (Mar. 1964), Kerang (Oct. 1964) and 6 miles N.W. of Benalla (Dec. 1964).

Page 124

Line 9 up (re *Avena alba*). Replace this name by **A. barbata* Pott ex Link (cited as a synonym on next line). Mansfeld in *Kulturpfl. Beih.* 2: 478 (1959) has stated that the type of *A. alba* Vahl consists of an *Arrhenatherum* species.

Page 125

Line 2 (re *Avena barbata*). After "N.S.W.," insert: Tas.,

Line 15 (re *Avena strigosa*). After "N.Z." insert: , Tas.

Line 10 up (re *Amphibromus gracilis*). After "at" insert: Barmah Forest and.

Page 126

Lines 14 & 15 (re *Amphibromus archeri*). After "Ballarat district," insert: Gorae West near Portland,. After "(1939)" insert: and at Hazelwood near Morwell (Dec. 1965).

Line 2 up (re *Amphibromus recurvatus*). Before "Gorae West" insert: Lower Glenelg R., extending to.

Page 129

Line 8 (re *Koeleria phleoides*). After "long" insert: normally.

Line 20. After "other State." add:

In his *Grasses of Burma, Ceylon, India and Pakistan* 445 (1960), N. L. Bor has placed *Koeleria phleoides* and *Trisetum pumilum* in a distinct genus *Lophochloa* Reichenb. (1830), distinguished chiefly by its annual habit. This concept is adopted in Hj. Eichler's *Suppl. J. M. Black's Flor. S. Aust. (ed. 2): 63* (1965).

Page 132

Line 9 up (re *Holcus mollis*). Replace "district" by: and Thorpdale districts.

Page 135

Lines 22 & 23 (re *Phalaris arundinacea*). After "W.A." insert: , Tas. (Cressy Agric. Experiment Stn.). After "Flinders," insert: Tarwin R. at Leongatha.,

Line 2 up. After "lemmas" insert: sometimes.

Page 138

Lines 5 & 6 up (re *Deyeuxia brachyathera*). Delete "but the origin . . . dubious", and replace by: with an isolated occurrence on Mt. William in the Grampians at 3800 ft. alt.

Page 140

Line 22 (re *Deyeuxia carinata*). After "region)" add: , Tas. at Mt. Field (Apr. 1964).

Between lines 10 & 11 up insert:

?*D. setifolia* Hook. f. *Flor. N.-Z. 1: 299, t. 65B* (1853).

A small alpine species, in most structural features close to the near-coastal *D. minor*, but with relatively longer looser panicles on much shorter culms (15-40 cm. high in *D. minor*). It has been collected at Mt. Kosciusko (Mar. 1959) and on the Bogong High Plains, Vic. (1966). Dr. Joyce W. Vickery states: "*D. setifolia* . . . has much in common with the two specimens I have seen from the Australian Alps, but I could not regard it as a perfect match; the spikelets are a little larger and the awn a little longer." New Zealand *D. setifolia* is figured also in John Buchanan's *Indig. Grasses N.Z. t. 24B* (1879).

Last line (re *Deyeuxia rodwayi*). After "Howe Ranges)" insert: , also in Grampians.

Page 142

Lines 16, 17 & 18 up (re *Deyeuxia parviseta*). Replace "a single collection" by: two collections,. After "(Mar. 1953)" insert: , and Lake Mountain at 4700 ft. (Mar. 1964). After "N.S.W." add: , also in Tas. at Mt. Field (Apr. 1964).

Page 143

Line 21 (re *Agrostis rudis*). Before "Main Ck" insert: Guy's Forest Ck near Shelley, Mt. Buffalo,;

Page 144

Line 17 up (re *Agrostis semiverticillata*). After "Anglesea)." add:

[In *Flor. Brit. Isles* ed. 2: 1175 (1962), Clapham, Tutin & Warburg adopt for this taxon the name *Polypogon semiverticillatus* (Forsk.) Hylander, 1945. The transfer

was doubtless made because of the deciduous glumes (as with *Polypogon*) in Water Bent, and is accepted in Hj. Eichler's *Suppl. J. M. Black's Flor. S. Aust. (ed. 2)*: 51 (1965).]

Page 145

After line 23 (re *Agrostis tenuis*) add:

[In Jan. 1964 the variety *aristata* (Parnell) Druce was discovered in quantity on river flats at Studley Park, Melbourne; it differs from the usual awnless form in having a basally attached arista twice as long as the lemma.]

Line 3 up. For "muelleriana" read muellerana.

Page 147

Between lines 15 & 16 up insert:

A. *meionectes* J. W. Vickery in *Contr. N.S.W. Herb.* 4: 12 (1966).

A small tufted alpine grass (4-12" high), known in Victoria by only one collection from Crystal Brook on Mt. Buffalo Plateau at ± 4500 ft. alt. (Feb. 1963), but extending to the Kosciusko Plateau, N.S.W. It is closely related to both *A. aemula* and *A. avenacea*, differing in the small stature, finer shorter leaves, small panicle and shorter, straight or only slightly geniculate awns.

Page 149

Line 7 (re *Polypogon maritimus*). After "N.Z.," insert: Tas.,

Line 22 (re *Gastridium phleoides*). After "Bundoora" insert: , Victoria Valley in Grampians.

Page 152

Line 8 (re *Alopecurus pratensis*). Replace bracket by a comma, and after "Corio" insert: , Yea (Oct. 1967) and Kyneton (Nov. 1968).

Line 9. Replace bracket by letter "s".

Page 154

Lines 22 & 23. For "ZOISIEÆ" and "ZOISIA", read ZOYSIEÆ and ZOYSIA respect.

Page 155

Line 6 (re *Zoysia matrella*). After "Id)," insert: Tas.,

Page 158

Line 6 up (re *Eragrostis australasica*). After "also" insert: Lake Goldsmith, L. Murdeduke & Leigh R. at Inverleigh on western basalt plains and.

Page 159

Lines 1 & 3 (re *Eragrostis japonica*). For "Thumb." read Thunb.

After line 11 up (re *Eragrostis parviflora*) add:

[The closely related *E. molybdea* J. W. Vickery in *Contr. N.S.W. Herb.* 1: 338 (1951) has recently been identified by its author from clay flats along the Murray R. near Red Cliffs, where plentiful. It differs from *E. parviflora* in the much larger lemmas (2-3 mm. long).]

Page 163

Between lines 10 & 11 up insert:

**C. virgata* Swartz *Flor. Ind. occid.* 1: 203 (1797).

Vern.: Feather Finger-grass or Feather-top Chloris.

A robust glabrous annual to 3 ft., the several whitish feathery spikes remaining erect; fertile lemmas 3 mm. long, gibbous, truncate, ciliate along the marginal nerves and crowned at the summit with longer villous hairs, the slender awn 5-10 mm. long.

Indigenous to tropical America, but now a widespread weed of warmer regions, including all Australian States except Tasmania. Noted in Feb. 1963 as well established on several irrigated properties along the Murray Valley in Victoria, between Gunbower and Wemen (at Tresco, Piangil, Nyah etc.). For illustrations, see Black, *Flor. S. Aust.* ed. 2: fig. 176 (1943), also Hitchcock, *Manual Grasses U.S.* ed. 2: fig. 764 (1951).

Page 165

Between lines 5 & 6 up insert:

Tribe SPARTINEÆ

**Spartina maritima* (Curt., ut *Dactylis* sp.) Fernald in *Rhodora* 18: 180 (1916).

**S. townsendii* H. & J. Groves in *Rep. bot. (Soc.) Exch. Cl. Manchr* 1880: 37 (1881).

Vern.: Cord-grass and Townsend's Cord-grass.

In Victoria the firm establishment of *Spartina maritima* was first noted at the National Herbarium (Nov. 1960) for saline mud flats at Corner Inlet, near Foster; *S. townsendii* was subsequently recorded (Feb. 1963) by specimens from salty pasture at Lower Tarwin, about 18 miles farther west, and in March 1963 it was collected also on estuarine mud of the Tamar River, Tas. The former has spikelets < 15 mm. long and anthers only ± 5 mm., while the latter (a hybrid between *S. maritima* and *S. alterniflora*) differs in having spikelets 15 mm. long or more and conspicuous anthers 10 mm. long.

Page 166

Line 16. Replace **S. capensis* Kunth . . . by **S. africanus* (Poir., ut *Agrostis* sp., 1810) W. Robyns & R. Tournay in *Bull. Jard. bot. Brux.* 25³:242 (1955), and relegate the former name to synonymy thereunder.

Page 167

Line 20 up (re *Phragmites communis*). Before "Morris" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 301, col. (1968);.

Page 169

After line 16 up (the generic heading "137. DANTHONIA . . .") add:

[In *N.Z. J. Bot.* 1¹: 87-126 (1963), V. D. Zotov describes four new genera in the tribe *Danthoniæ* and apportions among them all New Zealand species hitherto referred to *Danthonia*. New combinations under *Notodanthonia* (l.c. p. 104) are effected for the following Victorian species which occur also in New Zealand: *D. carphoides*, *D. auriculata*, *D. geniculata*, *D. purpurascens*, *D. semiannularis*, *D. caespitosa*, *D. laevis*, *D. pilosa*, *D. racemosa* and *D. penicillata*. According to this narrower concept, the remaining 14 species of *Danthonia* in Victoria would doubtless also have to be assigned to *Notodanthonia*.]

Page 177

Line 25 (re *Triodia irritans*). Before "Burbidge" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 177, col. (1968);.

Page 178

Line 6 up (re *Pentaschistis airoides*). After "Mildura)," insert: also Lara (Dec. 1967),.

Page 180

Line 6. For "3-6" read 3-6".

Page 186

Line 16 up (re *Stipa compacta*). After "Prom." insert: , Phillip Id) and on scoria at Tower Hill near Koroit.

Page 187

Line 21 up (re *Stipa nervosa*). Replace "Nil" by: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 347, col. (1968).

Line 15 up (re *S. nervosa*). After "south-east)" add: , Tas. (Copping).

Page 188

Line 7 (re *Stipa nivicola*). For "two" read three, and after "viz." insert: High Plains near Mts. Wellington & Reynard,.

Page 190

Line 5. Replace *P. fulgidum* D. K. Hughes ... by *P. simile* Domin in *Bibl. bot., Stuttgart* 20 (Heft 85): 322 (1915), and relegate the former name to synonymy thereunder.

Page 191

Line 3 up (re *Panicum decompositum*). After "Apr. 1958," insert: Kerang in Jan. 1965, Tallangatta in Feb. 1964, Tooradin district in Mar. 1967,.

Page 193

After line 13 (re *Paspalidium gracile*) add:

[In Jan. 1854 F. Mueller collected the closely related species, *P. constrictum* (Domin) C. E. Hubbard, among granite rocks at Mt. Hope; but the record does not seem to have been re-established during the past century. *P. constrictum* differs from *P. gracile* in having the fruiting lemma concentrically and *coarsely rugose*—not minutely reticulate-rugulose.]

Page 195

Line 11 (re *Entolasia marginata*). After "Snowy R.)" insert: , with isolated and perhaps now-extinct occurrences in the N.E. at Strathbogie & Warby Ranges (Feb. 1853).

Page 198

Between lines 5 & 6 up insert:

**Axonopus affinis* A. Chase in *J. Wash. Acad. Sci.* 28: 180, fig. 1-2 (1938).
Vern.: Narrow-leaved Carpet Grass.

A glabrous perennial with long-creeping stolons, glabrous nodes and slender flowering culms 6-12" high; leaf-blades flat, $\pm 2-8$ " long, 2-6 mm. wide, obtuse; inflorescence of 2-5 slender subdigitate racemes 2-3" long; spikelets 2-2.5 mm. long, sessile, erect, closely appressed, sparsely hairy; upper glume and sterile lemma equal, acutish; fertile lemma shorter, pale, obtuse.

The genus differs from *Eriochloa* in having no bulb-like callus at base of spikelet and no lower glume, while it departs from *Paspalum* in that the backs of the fertile lemmas are turned away from the rhachis. In addition to the Victorian occurrences in Melbourne district and Echuca, already recorded under the name "*A. compressus*" (see p. 207, lines 18 & 19) as a result of mis-identification, there are now reliable

records also for Nyah West and Maffra. This widespread American grass has long been naturalized in N.S.W. For an illustration, see Hitchcock, *Manual Grasses U.S. ed. 2: fig. 860* (1951).

Page 201

Line 12 (re *Setaria geniculata*). For "Banalla" read Benalla.

Page 209

Line 23 up (re SORGHUM). For "*glabrous pedicels*" read: \pm hairy pedicels.

Page 210

Line 25. Replace *B. ambigua* S. T. Blake ... by *B. macera* (Steud., ut *Andropogon* sp.) S. T. Blake in *Proc. roy. Soc. Qd* 80: 64 (1969), and relegate the former name to synonymy thereunder.

Page 213

Line 24 (re *Themeda avenacea*). After "mis-identification" add: In Jan. 1962 an undoubted example of this species was collected (from clumps 6 ft. high) at Tennyson, between Rochester and Mitiamo—the seed possibly introduced by travelling stock.

Page 216

Line 11 up (re *Cyperus gymnocaulos*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 267, col. (1968);.

Page 217

Line 21 (re *Cyperus tenellus*). Delete "mainland".

Lines 16 & 17 up (re *Cyperus flaccidus*). For "collection was" read: collections are. After "1895" insert: and Sandalong Park at Mildura (Jan. 1951).

Page 219

Line 22 (re *Cyperus nervulosus*). For "Kkenth." read Kükenth.

Line 26 (re *C. nervulosus*). Change line to read: by only two collections, viz. in far North-west but without precise locality (1935) and Lake Hattah (Feb. 1953);.

Page 220

Line 3 (re *Cyperus subulatus*). After "(Jan. & Feb. 1895)" insert: and a more recent collection (Feb. 1963) from Clear Lake, \pm 25 miles south-west of Horsham.

Page 225

Line 23 (re *Scirpus americanus*). Before "S.A." insert: Tas.,.

Line 14 up (re *Scirpus nodosus*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 297, col. (1968);.

Page 231

Line 19. Replace *S. merrillii* (Palla) Kükenth. ex Merrill ... by *S. subtilissimus* (Boeck., ut *Isolepis* sp., 1858) S. T. Blake in *Contr. Qd Herb.* n. 8: 20 (Sept. 1969), and relegate the former name to synonymy thereunder.

Page 232

Line 13 up (re *Scirpus congruus*). After "W.A." add: , N.S.W. (Cocoparra Range near Griffith).

Page 233

Line 8 (re *Scirpus australiensis*). After "National Park)" insert: also Goulburn Valley at Nathalia.

Line 13. Replace *S. calocarpus* S. T. Blake . . . by *S. hookeranus* (Boeck., ut *Isolepis* sp., 1858) S. T. Blake in *Contr. Qd Herb.* n. 8: 19 (Sept. 1969), and relegate the former name to synonymy thereunder.

Line 8 up (re *Eleocharis sphacelata*). Before "Blake" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 251, col. (1968);.

Line 3 up (re *E. sphacelata*). After "-west" insert: , but very localized in the highlands (e.g. Lake Catani on Mt. Buffalo, subalpine flats along Delegate River at Bidwell). After "N.Z." add: , N.G.

Page 234

Line 1. After "high" insert: (sometimes to 12" in barren proliferous forms of *E. atricha*).

Line 22 (immediately before *Eleocharis acuta*). For "*thin*" read *turgid and ribless*.

Line 30 (immediately before *Eleocharis pallens*). Replace "*thickened*" by *ribbed*.

Lines 8 & 9 up (re *E. pallens*). Amend the data after "*Distr.:*" to read: Apparently rare, but perhaps overlooked, in Victoria where known by only three collections, viz. Macarthur district between Hamilton & Port Fairy (May 1963), irrigation channel 8 miles S.E. of Robinvale where locally abundant (Mar. 1963), and the original early record from Avoca River (Dec. 1853).

Page 235

Line 19 (immediately before *Eleocharis atricha*). After "nut)" insert: , culms \pm curved flaccid and yellow-green (0.5-1.0 mm. thick);.

Lines 22 & 23 (re *E. atricha*). Amend the data after "*Distr.:*" to read: Scattered almost throughout Victoria where often forming continuous patches (frequently with barren proliferating culms) on drying mud of temporary swamps, drainage channels and seepage areas among slabs of rock (e.g. Big Desert north of Serviceton, Mt. Arapiles, Grampians, Mt. Beckworth near Clunes, Clayton North, Beechworth district and Pine Mtn. near Walwa); S.A. (mallee tracts adjoining Vic. border), N.S.W., Qd.

Page 237

Line 27 (re *Rhynchospora brownii*). Alter "a single collection" to read: only two collections from Happy Valley near Myrtleford (Jan. 1938) and.

Page 238

Line 5 (re *Schoenus fluitans*). Alter the data after "*Distr.:*" to read: Localized in Victoria where known from the far S.W. (lower Glenelg R. and near S. Aust. border west of Dergholm), Black Range west of Grampians, also Barwon R. near Geelong (1883); also S.A., Tas.

Page 239

Line 21 (re *Schoenus nanus*). After "*Distr.:*" replace the initial clause by:

Scattered through W. Wimmera & Mallee from Mt. Arapiles to North-west, but . . .

Page 240

Between lines 17 & 18 insert:

S. carsei Cheeseman *Manual N.Z. Flor.* 781 (1906).

Locally plentiful on damp heaths in far S.W. (lower Glenelg R. etc.) and Wilson Prom.—also S.A., N.Z. Differing from *S. brevifolius* in its much *more slender culms*, very narrow panicles and spikelets with only *one perfect flower*; in the tussock-forming habit it bears a superficial resemblance to *Lepidosperma filiforme*, and has probably been overlooked until quite recently.

Line 2 up. For "*coarsely reticulate and pitted*" read: minutely reticulate or almost smooth.

Page 241

Lines 7 & 8 (re *Schoenus latelaminatus*). After "Seat" insert: , Mt. Beckworth near Clunes,. After "rare" add: , S.A. (Penola district).

Between lines 8 & 9 insert:

S. sculptus Boeck. in *Linnæa* 38: 286 (1874).

Known in Victoria only from heaths at the northern Grampians and near the easternmost arm of Rocklands Reservoir (Dec. 1968): otherwise it occurs in S.A. (Dudley Penins.) & W.A. Differing from *S. latelaminatus* in the *purplish leaf-sheaths* and glumes, smaller spikelets (< 8 mm. long) in rather crowded groups and *coarsely reticulate*, deeply pitted and \pm *granular* nuts.

Line 14 (re *Schoenus apogon*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 326, col. (1968);.

Page 242

Last line (re *Cladium articulatum*). After "Qd," insert: N.G.,.

Page 244

Line 12. Replace *C. glomeratum* R. Br. . . by *C. rubiginosum* (Spreng., ut *Fuirena* sp., 1807) Domin in *Bibl. bot., Stuttgart* 20 (Heft 85): 476 (1915), and relegate the former name to synonymy thereunder.

Page 245

After line 14 (concluding *Cladium*) add:

[In *Contr. Qd Herb.* n. 8: 22-30 (Sept. 1969), S. T. Blake gives reasons for his adopting the generic name *Baumea* Gaudich. for most Australian populations hitherto referred to *Cladium*. With acceptance of this concept, all the foregoing Victorian species of *Cladium*, excepting *C. procerum* (n. 533), must be transferred to *Baumea* under which the necessary combinations have already been made, viz.:

p. 242. *C. articulatum* = *Baumea articulata* (R. Br.) S. T. Blake *l.c.* 28 (1969).

p. 243. *C. tetragonum* = *B. tetragona* (Labill.) S. T. Blake *l.c.* 30 (1969).

C. acutum = *B. acuta* (Labill.) Palla in *Allg. bot. Z.* 8: 69 (1902).

p. 244. *C. laxum* = *B. laxa* (Nees) Boeck. in *Linnæa* 38: 245 (1874).

C. glomeratum = *C. rubiginosum* (Spreng.) Domin = *B. rubiginosa*. (Spreng.) Boeck. in *Linnæa* 38: 241 (1874).

C. gunnii = *B. gunnii* (Hook. f.) S. T. Blake *l.c.* 27 (1969).

C. teretifolium = *B. teretifolia* (R. Br.) Palla in *Allg. bot. Z.* 8: 69 (1902).

p. 245. *C. junceum* = *B. juncea* (R. Br.) Palla *l.c.* 69 (1902).]

Page 246

Line 6 (re *Gahnia clarkei*). After "Hawkesdale," insert: Tower Hill near Koroit.,

Delete lines 10-13 and replace by:

G. grandis (Labill., ut *Scleria* sp., 1800) S. T. Blake in *Contr. Qd Herb.* n. 8: 33 (Sept. 1969).

G. psittacorum Labill. *Nov. Holl. Plant Specim.* 1: 89, t. 115 (1805). *Vern.*: Brickmaker's Sedge (Cutting-grass—Tas.).

Robust perennial tussock 4-8 ft. high; leaves very long, narrow, inrolled, with sharply scabrous margins; panicle black, drooping, 1-2 ft. long or more; spikelets claviform, 5-8 mm. long; glumes 10-15, obtuse, tightly imbricate; flowers 2, only 1 ovulate; staminal filaments 3-6, much intertwining and finally long-exserted (1-2 cm. as in the black-fruited *G. melanocarpa*), firmly adhering to base of nut which dangles conspicuously in air; nut fusiform, 4-5 mm. long, 2 mm. wide, pale yellow to bronze but blackish at acute apex, lustrous, the included pericarp with 5-10 transverse wrinkles.

The species had been erroneously recorded for Victoria by Ewart (1931), under its synonymous name *G. psittacorum* Labill., on the basis of misidentified *G. clarkei*; but a genuine example was collected near Gembrook in March 1964, and occurrences in other Victorian localities are to be expected. Otherwise, *G. grandis* ranges from southern Tasmania to eastern New South Wales.

Line 17. For *sieberiana* read *sieberana*.

Line 19 (re *Gahnia sieberana*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* tt. 356 & 357, col. (1968);

Between lines 17 & 18 up insert:

G. subaequilum S. T. Blake in *Contr. Qd Herb.* n. 8: 37 (Sept. 1969).

A tussock with culms 2-5 ft. tall, on wet flats along upper Delegate R. at ± 3000 ft. alt. (Mar. 1964)—also N.S.W., A.C.T., Qd (south-east). Closely related to *G. sieberana*, but differing in the solid few-noded culms, less compound inflorescence, scabrid glumes and larger, acute, prominently 3- to 4-angled nuts.

Page 247

Line 8 (re *Gahnia filum*). After "(l.c.)" add: ; Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 194, col. (1968).

Line 23 (re *Gahnia radula*). Before "Fitch" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 14, col. (1968);

Between lines 2 & 3 up insert:

G. deusta (R. Br., ut *Cladium* sp.) Benth. *Flor. aust.* 7: 416 (1878).

A viscid heathland tussock 1-2 ft. tall, at Dadswell's Bridge 19 miles N.W. of Stawell (Aug. 1964)—also S.A.

Differing from *G. lanigera* in its larger size, longer panicles (8-12"), twice the number of stamens (4-7) and leaves with scabrid margins.

Page 250

Line 4 (re *Lepidosperma viscidum*). After "Bendigo" insert: and coastal heaths of far E. Gippsland.

Page 251

Line 1 (re *Lepidosperma laterale*). Delete the comma after "variable".

Line 13 up (re *Lepidosperma tortuosum*). After "Mt. Wellington" insert: , also in Kinglake Nat. Park and Lerderderg Ranges between Bullengarook & Blackwood.

Lines 4 & 5 up (re *Lepidosperma forsythii*). After "Gippsland," insert: Wilson Prom.,. After "Genoa" insert: , with an isolated western occurrence along the upper Glenelg R. in Victoria Valley.

Page 252

Line 8 (re *Lepidosperma carphoides*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 27, col. (1968);.

Line 2 up (re *Lepidosperma semiteres*). After "Frankston") insert: , with isolated occurrences near Tidal R. at Wilson Prom. and on heaths around Howe Ranges in far E. Gippsland.

Page 253

Line 20 (re *Lepidosperma filiforme*). After "Range" insert: , wet coastal heaths of far E. Gippsland.

Line 13 up (re *Tricostularia pauciflora*). Replace "and" by a comma, and after "Port" insert: , coastal grass-tree plains between Wingan Inlet & Cape Howe.

Page 255

Line 9 up (re *Oreobolus pumilio*). Before "Fitch" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 521, col. (1968), as *O. distichus*;

Between lines 4 & 5 up insert:

O. oxycarpus S. T. Blake in *Contr. Qd Herb.* n. 8: 40 (Sept. 1969).

A cushion-forming alpine perennial with foliage almost intermediate in character between that of *O. distichus* and *O. pumilio*, but quite distinct from both these species in its nut which is *acutely conical* at apex and *twice as long* as the perianth-segments.

This new species, which has 2-4 spikelets in the inflorescence, is known in Victoria with certainty only from Lake Mtn. (at ± 4700 ft.), but most probably has a much wider range in alpine tracts farther E. & N.E.; Tas., N.S.W. and A.C.T.

Page 260

Line 1 (re *Carex hebes*). For "Gorae West" read Narrawong.

Between lines 3 & 4 insert:

—As for the last, but mature utricles *twice as long* as the pallid glumes (which are only 1 mm. wide) and *spreading stellately*:

C. echinata Murr. [See No. 592].

Line 16 (re *Carex inversa*). For "Maroka" read Moroka.

Page 261

Line 24 (re *Carex divisa*). After "King Id" insert: , W.A. (Busselton, Sept. 1963).

Line 7 up (re *Carex disticha*). After "naturalized" add: In Feb. 1963 a single large plant was noted at Crystal Brook on Mt. Buffalo Plateau (± 4500 ft. alt.).

Page 262

Line 11 up (re *Carex gaudichaudiana*). Before "Fitch" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 260, col. (1968);

Page 264

Line 3 (re *Carex fascicularis*). Before "Hamlin" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 263, col. (1968);

Page 265

Line 19. Replace **C. canescens* L. ... by **C. buxbaumii* Wahlenb. in *K. svenska Vetensk. Akad. Handl.* 1803: 163 (1803), and add:

[In Clapham, Tutin & Warburg's *Flor. Brit. Isles* ed. 2: 1101 (1962), the earlier name *C. canescens* L. is rejected as a 'nomen ambiguum']

Page 269

Line 20 (re *Lemna trisulca*). After "Geelong district)," insert: also Wilson Prom. (Sept. 1963) and Heyfield (Jan. 1964) in Gippsland.

Page 270

Lines 9 & 10 (re *Lemna oligorrhiza*). For "a" read also, and delete words "record . . . origin".

Line 18 up (re *Lemna polyrrhiza*). After "(Nov. 1928)" insert: , and a more recent one from Heyfield (Jan. 1964).

Page 272

Replace line 6 up by:

617. *L. flexuosa* (Benth.) L. Johnson & O. Evans in *Contr. N.S.W. Herb.* 3: 224 (1963).

L. interrupta F. Muell. var. *flexuosa* Benth. *Flor. aust.* 7: 217 (1878);

L. interrupta sens. auct. Vict., non F. Muell. *Fragm. Phyt. Aust.* 8: 74 (1873).

Page 273

Line 20 (re *Lepyrodia tasmanica*). Before "Grampians" insert: heathlands of Portland-Kentbruck region and.

Page 275

Line 21 (re *Leptocarpus tenax*). After "(l.c.);" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* tt. 18 & 19 col. (1968);

Page 283

Line 24 (re *Luzula campestris*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 528, col. (1968), as var. *australasica*;

Page 285

Line 15 (re *Juncus ingens*). After "Brodribb River" insert: , with disjunct but abundant colonies along the Wannon R. south of Victoria Range.

Page 286

Line 9 up (re *Juncus effusus*). After "Victoria" delete remainder of sentence (up to "N.S.W.") and replace with: to Mt. Buffalo (Feb. 1963).

Line 4 up. Replace *J. polyanthemus* Buch. . . by *J. usitatus* L. A. S. Johnson in *Contr. N.S.W. Herb.* 3: 241 (1963), and after "Tas." (in last line) insert: and W.A.

Delete line 3 up.

After last line add:

J. sarophorus L. A. S. Johnson in *Contr. N.S.W. Herb.* 3: 242 (1963).

Close to *J. usitatus*, differing in its taller (to 6 ft.), thicker, blue-green culms with sunken stomata, more erect panicle-branches and relatively longer, sharp outer perianth-segments which slightly exceed the capsule. Widespread in Victoria, extending to N.S.W., Tas., S.A. & N.Z.

Page 287

Between lines 19 & 20 insert:

J. gregiflorus L. A. S. Johnson in *Contr. N.S.W. Herb.* 3: 243 (1963).

Close to *J. australis*, differing in its brighter green culms with quite smooth grooves and superficial stomata, and in the slightly shorter, more brownish capsules. Widespread in Victoria; N.S.W., Tas., S.A., W.A., N.Z.

J. procerus E. Mey. in *Linnaea* 3: 367 (1828).

Differing from *J. australis* and *J. gregiflorus* in its more robust (3.5-8.0 mm. diam.), soft yellow-green culms and flattened tops to the capsules. Southern parts of Victoria; N.S.W., Tas., W.A., N.Z.

Page 289

Between lines 21 & 22 insert as a synonym of *Juncus bufonius*:

J. plebeius R. Br. *Prodr. Flor. Nov. Holl.* 259 (1810).

Last line (re *Juncus tenuis*). After "Apr. 1941" add: , also at Lake Catani on Mt. Buffalo (Feb. 1963).

Page 290

Line 19. Replace *J. plebeius* R. Br. . . by *J. homalocaulis* F. Muell. ex Benth. *Flor. aust.* 7: 128 (1878) and cite thereunder in synonymy: *J. plebeius* sens. auct. plur., non R. Br. (1810). The type of *J. plebeius* R. Br. is referable to *J. bufonius* L.

Lines 21 & 22. For "as '*J. homalocaulis*'" read: —the first two as "*J. plebeius*."

Page 291

Line 7 (re *Juncus bulbosus*). After "Nov. 1950" insert: , also at Lilydale (Dec. 1965).

Page 292

Lines 14 & 16 (re *Juncus acutiflorus*). After "N.Z.," insert: Tas. (Flinders Id.). After "Orbost)" add: , also in the west at Colac and Heywood districts.

Page 295

Line 19 (re *Asphodelus*). For "228" read 220.

Page 296

Line 5 up (re *Xanthorrhoea australis*). Before "Beuhne" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 80, col. (1968);

Page 297

Line 13. Replace *X. hastilis* R. Br. . . . by *X. resinosa* Pers. *Synops. Plant. 1*: 370 (1805), and relegate the former name to synonymy thereunder.

Line 19. After "(1845)" add: —all as "*X. hastilis*."

Line 7 up (re *Lomandra effusa*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict. t. 155, col.* (1968);.

Page 298

Line 25 (re *Lomandra filiformis*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict. t. 36, col.* (1968);.

Line 11 up (re *L. filiformis*). After "Drummer" add:; N.S.W., Qd.

Page 300

Line 23 (re *Lomandra longifolia*). Before "Galbraith" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict. t. 37, col.* (1968);.

Line 7 up. Delete the query (?) from *L. confertifolia*.

Page 301

Line 3 (re *Lomandra confertifolia*). After "level." add:

In *Contr. N.S.W. Herb. 3*: 158 (1962), Mrs. A. T. Lee assigns this Victorian (and southern New South Wales) plant to a new subspecies, *leptostachya* A. T. Lee, of *L. confertifolia*.

Page 304

Line 21 (re *Caesia vittata*). Before "Galbraith" insert: Hösel, *Wildflowers S.-E. Aust. 35, col.* (1969);.

Line 16 up (re *Herpolirion novae-zelandiae*). Before "Reeves" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict. t. 529, col.* (1968);.

Page 305

Line 2 up (re *Dichopogon strictus*). Before "Lee" insert: Hösel, *Wildflowers S.-E. Aust. 34, col.* (1969);.

Page 306

Line 22 (re *Dichopogon fimbriatus*). After "Avoca R.," insert: Wyperfeld Nat. Park;.

After line 23 add:

[In his *Suppl. J. M. Black's Flor. S. Aust. (ed. 2)*: 83 (1965), Hj. Eichler expresses the opinion that *Dichopogon* should not be separated from *Arthropodium*, and he returns *D. strictus* & *D. fimbriatus* to the latter genus.]

Line 14 up (re *Thysanotus patersonii*). Before "Blackall" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict. t. 16, col.* (1968);.

Page 307

Line 17 up (re *Thysanotus baueri*). After "Mildura)" insert: , also Big Desert north of Yanac (Oct. 1962).

Page 309

Lines 14 & 15 up (re *Anthericeae*). For "parts of the Australian coast" read: some Australian coasts. For "*Anthericum divaricatum* N. J. Jacq." read: *Trachyandra divaricata* (N. J. Jacq.) Kunth.

Lines 10 & 11 up. Change "*A. divaricatum*" to *T. divaricata*.

Line 7 up. After "capsule." add:

Under the name "*Anthericum revolutum*" it is depicted by Edwards in *Curtis's bot. Mag.* 26: t. 1044, col. (1807), and under "*A. divaricatum*" by G. G. Smith in *W. Aust. Nat.* 6: fig. opp. 9 (1957). In *Bothalia* 7: 669-767 (1962) A. Amelia Obermayer has revised and re-defined the genera *Anthericum*, *Chlorophytum* and *Trachyandra*—by far the largest of the three.

Page 311

Lines 5 & 6 up (re *Sowerbaea juncea*). Before "Woodside" insert: Moe district,. After "Qd." add: , Tas. (Anson's Bay, Nov. 1964).

Page 312

Line 18 (re *Astelia alpina*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 534, col. (1968);.

Line 11 up. Replace *A. nervosa* Banks . . . by *A. australiana* (J. H. Willis) L. B. Moore in *N.Z. J. Bot.* 4: 229 (June 1966), and cite thereunder as basionym: *A. nervosa* Banks & Solander ex Hook. f. (1853) var. *australiana* J. H. Willis in *Kew Bull.* 1939: 175 (1939).

Delete lines 9 & 10 up (illustrative citations).

Line 3 up (re *Astelia australiana*). After "but" insert: the most closely related species, *A. nervosa*, is.

Page 313

Delete lines 1 to 4 (inclus.).

Line 7 up (re *Dianella tasmanica*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 454, col. (1968);.

Page 315

Line 13 (re *Stypandra caespitosa*). Before "Lee" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 47, col. (1968);.

Line 13 up (re *Stypandra glauca*). Before "Galbraith" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 204, col. (1968);.

Page 318

Line 9 up (re *Geitonoplesium cymosum*). After "Cunn" insert a full stop.

Page 319

Line 17 (re *Eustrephus latifolius*). Before "Galbraith" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 473, col. (1968);.

Page 320

Line 17 (re *Smilax australis*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 476, col. (1968);.

Page 322

Line 3 up (re *Allium triquetrum*). After "Nat. Park" add: , Leongatha.

Page 323

Between lines 24 & 25 insert:

**A. ampeloprasum* L. *Spec. Plant.* 1: 294 (1753).

Vern.: Wild Leek.

Leaves flat, to 2 ft. long and 1-3.5 cm. wide, \pm glaucous; scape terete, stout, tough, 2-6 ft. high; spathe 1-valved, falling before anthesis; umbel very many-flowered, to 4" wide; perianth pale purplish, 8 mm. long; style exserted; stamens slightly exserted, the lateral points of inner filaments much longer than antheriferous one.

This Mediterranean plant differs from *A. scorodoprasum* in its longer, wider leaves, taller scapes, much more numerous flowers and solitary spathe-valve. It is the probable ancestor of the cultivated garden leek (*A. porrum* L.), and in recent years it has been noted as spontaneous near Yandoit (Jan. 1963) and at Mallacoota (Jan. 1964). Occurrences around Adelaide and Encounter Bay (S.A.) have been known since 1940.

Page 328

Line 7 (re *Hypoxis* key). For "1" read 2".

Line 26 (re *Hypoxis* key). Delete words "above middle".

Line 27 (re *Hypoxis* key). For "1" read 2".

Line 13 up (re *Hypoxis pusilla*). After "Dimboola," insert: Wyperfeld Nat. Park,.

Page 330

Delete lines 8 & 9 up and replace by:

744. **R. longifolia* (Salisb.) J. G. Baker in *J. Linn. Soc. (Bot.)* 16: 89 (1877).

Trichonema longifolium Salisb. in *Trans. hort. Soc. Lond.* 1: 316 (1812);

T. cruciatum Gawl. in *Curtis's bot. Mag.* 15: t. 575, col. (1802), non Jacq. (1789);

Line 5 up. After "(1943)" insert: , as "*R. rosea*".

Line 2 up. After "(1901)" insert: , as "*R. rosea*". Delete reference "Dixie ... (1915)".

Page 334

Line 3 (re *Diplarrena moraea*). Before "Galbraith" insert: Rosser, *Wildflowers Vict.* 25, col. (1968);.

Line 14 (re *D. moraea*). After "Howe Range)" insert: , also in W. Vic. along Kennedy's Ck road between the Gellibrand & Curdie's Rivers.

Page 335

Line 6 (re *Libertia paniculata*). Before "Forster" insert: Hösel, *Wildflowers S.-E. Aust.* 36, col. (1969);.

Line 24 (re *Sisyrinchium iridifolium*). After "Wales" insert: , Tas. (Epping, King Id).

Line 8 up (re *Sisyrinchium micranthum*). After "Doncaster," insert: Fraser Nat. Park near Alexandra,.

Page 336

Line 6 (re *Patersonia fragilis*). Before "Williamson" insert: Hösel, *Wildflowers S.-E. Aust.* 33, col. (1969);.

Line 19 (re *Patersonia longiscapa*). Before "Black" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 29, col. (1968);.

Page 337

Line 2 (re *Patersonia sericea*). Before "Williamson" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 483, col. (1968);.

Line 19 (re *Orthrosanthus multiflorus*). Before "Galbraith" insert: Hösel, *Wildflowers S.-E. Aust.* 50, col. (1968);.

Line 23 (re *O. multiflorus*). After "Nelson" insert: and Port Campbell Nat. Park.

Page 343

Lines 20 & 21 up (re *Thismia rodwayi*). After "Dandenongs," insert: Wallaby Ck near Kinglake,. After "Wellington)" insert: , ?Qd (Lamington Nat. Park).

Page 345

(section 17 of key to ORCHIDACEÆ, re *Glossodia*). After "hairy" add: , usually *cumarin-scented*.

Page 347

Line 2 up (re *Thelymitra pauciflora* var. *holmesii*). After "Vic.," insert: also Tas. (Railton Hills & ?Bruny Id),.

Page 349

Line 2 up (re *Thelymitra media*). For "t. 8" read t. 9.

Page 350

Line 3 (re *Thelymitra media*). For "sothern" read southern.

Between lines 1 & 2 up insert:

T. mucida R. D. FitzG. in *Gdnrs' Chron.* new ser. 17: 495 (1882).

Hitherto regarded as endemic in Western Australia, *T. mucida* has been located on a swampy flat near Anglesea (Nov. 1969). It differs from *T. pauciflora* in the mid-lobe of column which is less arched, very deeply cleft, wholly dark purple and beset with a *conspicuous hoary bloom*; the yellow hair-tufts are also coarser and second rather than terminal.

Page 351

Line 9 up (re *Thelymitra retecta*). After "1948)" insert: , on Toorong R. north of Noojee (Jan. 1969) and at Healesville (Dec. 1969). After "Launceston" add: , Railton Hills, Lake St. Clair, Roseberry and many parts of west coast, also King Id).

Line 3 up. For "lebellum" read labellum.

Page 352

Line 16 (re *Thelymitra venosa*). After "W. Otways" insert: and swamps along upper Glenelg R. in Grampians.

Line 19 (re *Thelymitra cyanea*). For "25" read 23.

Page 353

Line 12 up (re *Thelymitra rubra*). Before "Nicholls" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 75, col. (1968);.

Page 354

Line 11 up (re *Thelymitra flexuosa*). Delete full stop after "Fenzl."

Page 355

Line 4 (re *Thelymitra antennifera*). After "Lindl" insert a full stop.

Line 6. After "Reg.", for "25" read 23.

Line 12 up (re *Calochilus imberbis*). After "Ringwood" insert: , Enfield near Ballarat, Cowwarr near Heyfield, 4 miles N.N.W. of Nowa Nowa, near Cape Everard.

Line 3 up (re *Calochilus richae*). After "(1955);" insert: Rotherham in *Vict. Nat.* 86: 318 & 319 (Nov. 1969);.

Page 356

Line 3 (re *Calochilus richae*). After "(Oct. 1928)" add: , and a second one from the same area (Oct. 1968).

Lines 9 & 11 up (re *Calochilus saprophyticus*). For "three" read four. After "Bridgewater" insert: , and Mallacoota Nat. Park.

Page 357

Lines 10 & 11 up (re *Calochilus grandiflorus*). Delete "but . . . awaited" and replace by: and a confirmatory collection was made at Mitta Mitta (Nov. 1964), so that the species should now be added to Victoria's flora.

Line 4 up (re *Diuris punctata*). After "1804" insert: -5.

Page 360

Line 5 up. For "labellom" read labellum.

Page 363

Lines 3 & 6 (re *Microtis atrata*). Delete ", but not in East Gippsland". After "Prom." insert: , Mallacoota.

Lines 15-17 (re *Microtis orbicularis*). Before "Wonthaggi" insert: Wilson Prom. &. After "Nov. 1942)" insert: , as well as at Woohlpooer near the Victoria Range (Nov. 1963). After "Mt. Julian)," insert: Tas. (Rocky Cape, Dec. 1964),.

Line 6 up. In "*unifolia*" change italics to bold-face type.

Line 4 up (re *Microtis unifolia*). After "Syst." insert: *Veg.*

Page 364

Lines 21-23 (re *Microtis biloba*). Replace "Known . . . flats" by: Widely scattered on damp, often inundated flats of Gippsland & N.E. (Montrose, Moe & Gould, Morwell, Wilson Prom., Mallacoota Inlet & Gabo Id, Derbyshire near Koetong),.

Page 365

Lines 9 & 10 (re *Microtis bipulvinaris*). For "and" substitute a comma, then insert: Wilson Prom. (Nov. 1969),. After "(1953)" insert: and Lower Glenelg R. near Greenwald (Jan. 1965). For "both" read: all.

Line 17 up (re *Prasophyllum despectans*). Before "Garnet" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 376, col. (1968);.

Lines 6 & 7 up (re *P. despectans*). Delete "subalpine," and before "on" insert: at Greta,. For "aslo" read: also.

Page 366

Line 14 (re *Prasophyllum nigricans*). For "nder udry" read: under dry.

Page 367

Line 13 up (re *Prasophyllum morrisii*). After "Genoa R." insert: & Howe Range.

Page 368

Line 14 up (re *Prasophyllum suttonii*). Before "Rogers" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 493, col. (1968);.

Page 369

Line 20 up (re *Prasophyllum australe*). After "Portland district," insert: near Black & Victoria Ranges,.

Page 372

Lines 19 & 20 (re *Prasophyllum pallidum*). Change "two" to three, and after "Grampians" insert: and Kaniva Parish in Little Desert (Oct. 1962)—very rare.

Page 373

Line 17 (re *Prasophyllum parviflorum*). After "Beechworth;" insert: Tas. (Pine Lake and near Waratah—on wet heath), and.

Page 374

Lines 2 & 3 (re *Prasophyllum rogersii*). For "two" read three, and after "(Nov. 1958)" insert: , Gillingal in Buchan district (Dec. 1963).

Page 375

Line 2 up (re *Prasophyllum frenchii*). Before "Urana" insert: Cocopara Range near Griffith,.

Page 377

Line 14 up (re *Spiculæa huntiana*). After "Nat.," for "8" read 5.

Page 378

Line 3 (re *Spiculæa huntiana*). Before "raceme" insert: complanate.

Page 379

Line 16 (re *Chiloglottis cornuta*). After "Otways" insert: and at Portland.

Page 381

Line 15 (re *Acianthus reniformis*). After "Penins." insert: &.

Page 385

Line 7 (re *Caladenia menziesii*). Replace the words "but . . . E. Gippsland" by: , Mallacoota Inlet.

Page 388

Lines 2 & 3 up (re *Caladenia clavigera*). After "Orbost" insert: , Wulgulmerang. Delete "old" and before "Yass" insert: Cocopara Range near Griffith,.

Page 392

Line 25 (re *Caladenia carnea*). After "Orchid Rev. 5:" insert 84.

Page 393

Line 8 (re *Caladenia caerulea*). Before "FitzGerald" insert: Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 343, col. (1968);.

Line 9 up (re *Caladenia congesta*). After "rare)" add: , A.C.T.

Page 395

Line 6 up (re *Caladenia iridescens*). After "districts" insert: , with an isolated eastern occurrence at Sperm Whale Head. Before "Circular Head" insert: Mole Creek &.

Page 396

Line 2 (re *Glossodia major*). Before "FitzGerald" insert: Stones in Curtis's bot. Mag. 175: new ser. t. 441, col. (1964);.

Line 28 (re *Caladenia tutelata*). After "(N.S.W.)" add: and at the Asbestos Range (N. Tas.).

Page 397

Lines 21 & 22 (re *Corybas diemenicus*). Replace citation "Rupp in *Proc.* . . . (1928)" by: H. M. R. Rupp & W. H. Nicholls ex H. M. R. Rupp in *Vict. Nat.* 59: 61 (1942).

Line 11 up (re *C. diemenicus*). Replace "and very rare)" by: where rare, also Batlow & Talbingo districts), A.C.T.

Lines 6 & 7 up (re *Corybas dilatatus*). Replace citation "Rupp in *Proc.* . . . (1928)" by: H. M. R. Rupp & W. H. Nicholls ex H. M. R. Rupp in *Vict. Nat.* 59: 61 (1942).

Line 5 up (re *C. dilatatus*). Replace "l.c. 35" by: *Proc. Linn. Soc. N.S.W.* 53.

Page 398

Line 13 (re *Corybas dilatatus*). After "Range;" insert: N.S.W. (Batlow & Talbingo near Tumbarumba), A.C.T.,.

Line 15: For "< 1 cm." read: > 1 cm.

Line 19 up (re *Corybas aconitiflorus*). After "Gembrook," insert: Darriman N.E. of Yarram,.

Page 399

Between lines 7 & 8 insert:

C. fordhamii (H. M. R. Rupp, ut *Corysanthes* sp.) H. M. R. Rupp in *Vict. Nat.* 59: 61 (1942).

Closely related to *C. unguiculatus*, but differing in its more slender, less arched column, relatively longer dorsal sepal, conspicuously *red-striped labellum* which has *no calli* extending from orifice to base, and much later flowering season (Sept.-Oct.). Scattered in shady paper-bark swamps along the E. Gippsland coast from Cape Everard to Mallacoota Nat. Park; S.A. (south-east and rare), N.S.W., Qd.

Line 12. For *hunteriana* read *hunterana*.

Page 400

Line 25 (re *Cryptostylis leptochila*). Delete reference under "Dickins" [The fig. 33 also represents *C. subulata*].

Page 401

Line 17 (re *Pterostylis barbata*). After "Maroubra" insert: , Abercrombie Caves S.S.W. of Bathurst and Kangaroo Range near Cowra.

Between lines 17 & 18 (re *P. barbata*) insert:

[In *Aust. Plants* 5: 138 (June 1969), Leo Cady has restricted *P. barbata* (syn. *P. turfosa* Endl.) to Western Australia, describing the E. Australian and New Zealand population as a distinct species, *P. plumosa*, with short but unfortunately mis-punctuated and confusing Latin diagnosis. Whether Australian orchidologists will accept this change is debatable.]

Page 404

Line 11 (re *Pterostylis furcata*). Before "H. M. R. Rupp" insert: Mainland Australian, New Zealand and some Tasmanian populations are referable to the variety *micromega* (Hook. f., ut sp.) E. D. Hatch in *Trans. roy. Soc. N.Z.* 80: 326 (Feb. 1953)—with larger flowers and longer overlapping stem-bracts.

Page 406

Lines 14-16 up (re *Pterostylis fischii*). After "Vern.:" insert: Winter Greenhood. *Distr.:* After "forest" insert: , and Traralgon district (June 1965). Before "N.S.W." insert A.C.T., and after "May 1955" insert: , and Gibraltar Range near Glen Innes.

Page 408

Line 10 up (re *Pterostylis obtusa*). After "S.A.," insert: Tas. (Flinders Id),

Line 4 up (re *Pterostylis alveata*). For "16." read 916.

Page 409

Lines 1 & 3 (re *Pterostylis alveata*). Delete "Apparently . . . where." After "forest" add: ; also N.S.W. (south-east coast).

Page 411

Line 2 up (re *Pterostylis nana*). Replace "Cobar district" by the following N.S.W. localities: The Rock & Wagga district, Cocopara Range, also central-western slopes at Yeoval, Cadia, Eugowra, Wyangala Dam near Cowra, Kangaroo Range, Abercrombie Caves S.S.W. of Bathurst, Peak Hill, Dubbo).

Page 415

Line 9 up. For "2-2.5" read 2-4.

Line 8 up. Replace *P. pusilla* R. S. Rogers . . . by *P. rufa* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810), and relegate the former name to synonymy thereunder. Also cite as a second synonym: *P. squamata* R. Br. *Prodr. Flor. Nov. Holl.* 327 (1810).

Page 416

Lines 10 & 11. Alter "The var. . . . *P. pusilla*" to read: The variety *aciculiformis* (W. H. Nicholls, ut *P. pusilla* var., 1936) J. A. P. Blackmore & S. C. Clemesha in *Orchadian* 2: 164 (1968) differs from typical *P. rufa* . . .

Line 18. Replace *P. rufa* R. Br. . . . by *P. biseta* J. A. P. Blackmore & S. C. Clemesha in *Orchadian* 2: 150 (1968).

Line 25. After "(1911)" add: —all as "*P. rufa*".

Lines 11 & 12 up. Alter "The var. *despectans* . . . *P. rufa*" to read: The population described by W. H. Nicholls in *Vict. Nat.* 66: 215 (1950) as *P. rufa* var. *despectans* has been regarded by some recent authors as an aberrant form of *P. biseta*, differing from other forms in . . .

Line 6 up. Replace *P. mitchellii* Lindl. by *P. boormanii* H. M. R. Rupp *Orchids N.S.W.* 98 (1943).

Last line. After "(1914)" add: —all as "*P. mitchellii*".

Page 417

Between lines 6 & 7 insert:

P. mitchellii Lindl. in *Mitch. J. exped. trop. Aust.* 365 (1848).

[Differing from *P. boormanii* in the narrower, non-ciliate lateral sepals and narrower, more pointed labellum with a tuft of cilia at base of lamina. It has been collected in Bendigo district, but precise range within Victoria is obscured by confusion with *P. boormanii*, and it extends to drier parts of N.S.W. and Qd. In *Orchadian* 2: 161 (1968) Blackmore & Clemesha have reduced this orchid to subspecific rank under *P. gibbosa* R. Br.]

Line 10. Replace *P. squamata* R. Br. . . . by *P. hamata* J. A. P. Blackmore & S. C. Clemesha in *Orchadian* 2: 154 (1968).

Line 12. Delete "Scammell . . . (1943)", which illustration is referable to a form of *P. biseta*.

Line 16. After "(1914)" add: —all as "*P. squamata*".

Line 19. For "Maldon" read Benalla.

Lines 22 & 23. Alter "The var. *valida* . . . wholly green" to read: The population described by W. H. Nicholls in *Vict. Nat.* 58: 115 (1941) as *P. squamata* var. *valida* is now considered referable to *P. boormanii* H. M. R. Rupp—a wholly green form.,

Page 421

Line 12. Replace *THRIXSPERMUM* Lour. (1790) by *PLECTORRHIZA* A. W. Dockrill (1967).

Line 13. Change to read: 941. *P. tridentata* (Lindl.) A. W. Dockrill *Australasian Sarcanthinae* 27, t. 14 (1967), and relegate *Thrixspermum tridentatum* to synonymy thereunder.

Line 16. Before "FitzGerald" insert: Dockrill (*l.c.*); Cochrane, Fuhrer, Rotherham & Willis, *Flowers & Plants Vict.* t. 485, col. (1968), as "*Thrixspermum tridentatum*".

Line 18. After "all" insert: but first two.

Page 422

After last line insert:

[In W. H. Nicholls's *Orchids of Australia* complete edition (Nov. 1969), all but two—viz. *Cryptostylis subulata* and *Pterostylis tenuissima*—of the known 175 species of orchids indigenous to Victoria are magnificently portrayed in full colour, with floral details dissected and variously magnified. It has not been possible to interpolate these in the lists of numerous illustrations cited between pp. 347 and 422.]

Page 423

Line 10 up (re *Eragrostis curvula*). After "Springvale" insert: , also at Wimmera R. between Horsham & Natimuk (Mar. 1964).

Line 3 up. Replace *D. adscendens* (Humb. et. al. . . . by *D. ciliaris* (Retz., ut *Panicum* sp.) Koeler *Descr. Gram. Gall. & Germ.* 27 (1802), and relegate the former name to synonymy thereunder.

Page 424

Line 17 up (re *Schœnus turbinatus*). After "1961." add:
It has since been collected also in the Grampians (Mt. William etc.) and on damp heathland against the Howe Ranges in far E. Gippsland.

RE INDEX

Page 453. For "*Agropyron littoralis*" read: *Agropogon littoralis*.

Page 454. In *Anthericum divaricatum* change Roman type to italics.

Page 457. In *Carex pyrenaica* change epithet from Roman type to italics.

Page 458. Insert *Chlorophytum alpinum* 303, also *Corynotheca lateriflora* 303.

Page 463. In *Heleocharis* change Roman type to italics.

Page 466. After *Milium effusum*, for "186" read 136.

Page 473. In *Spiranthes lancea* change epithet from Roman type to italics.

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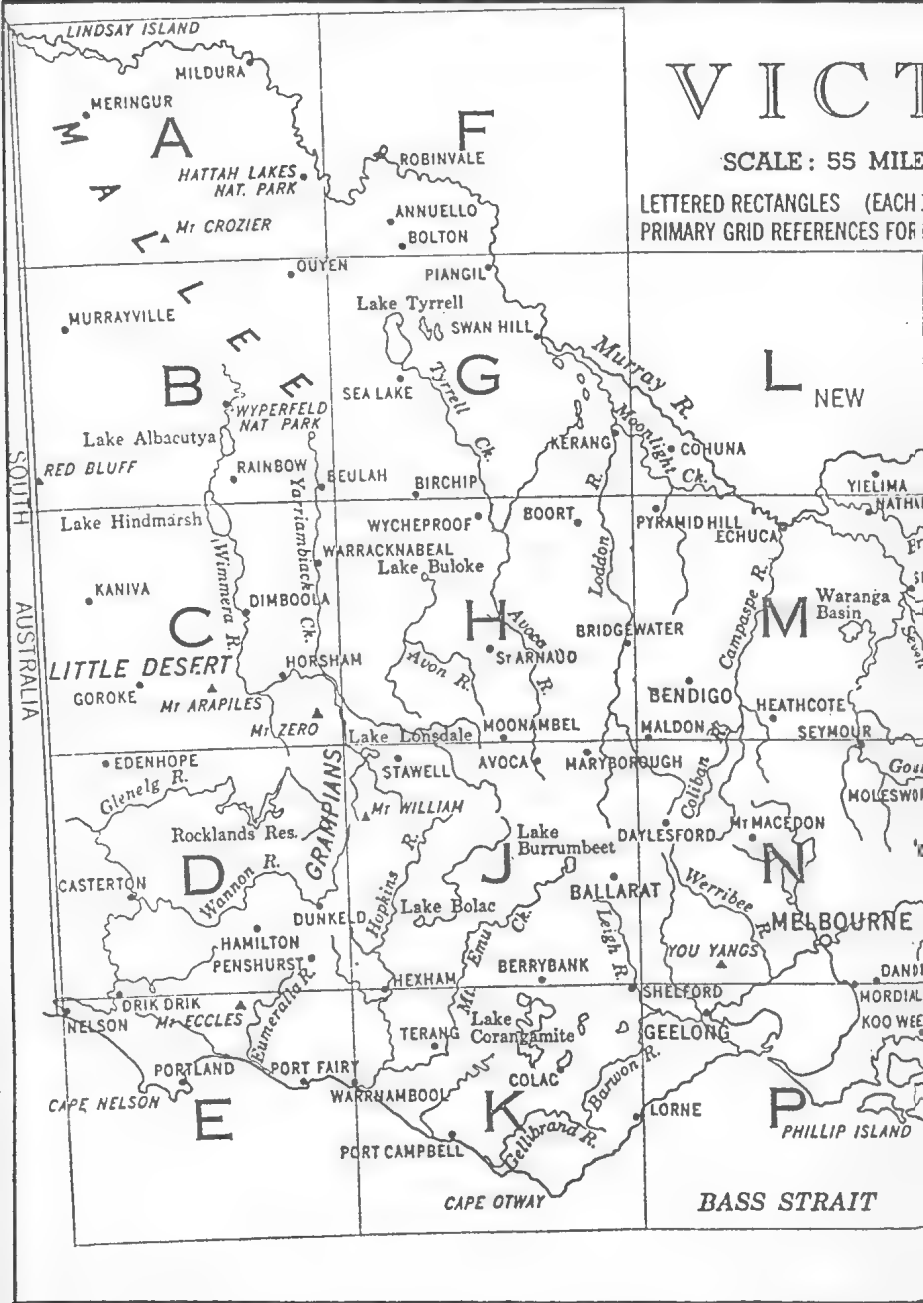
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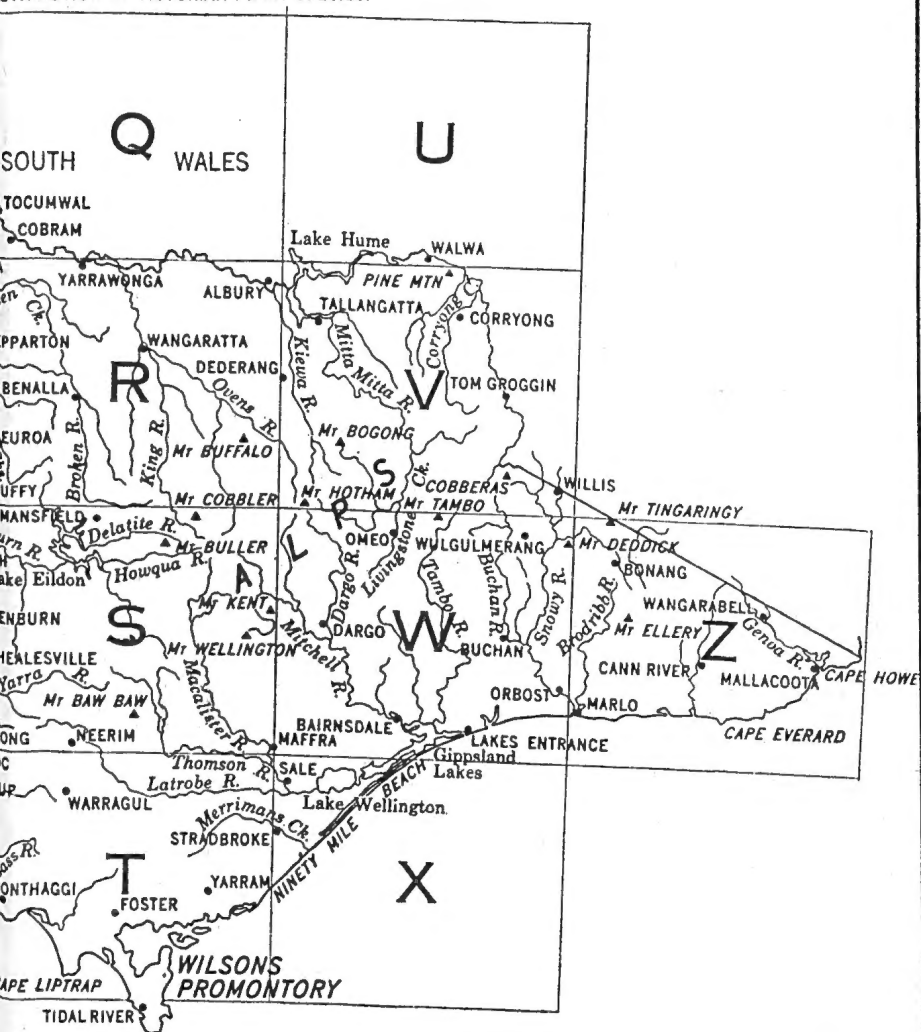
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The purpose of this book is to provide a means for readily identifying, in the field or herbarium, the various families, genera and species of vascular plants—both indigenous and naturalized—that occur spontaneously within the State of Victoria.

Although in key form throughout, this handbook provides much more information about individual species than so-called keys usually provide. But it must not be regarded as the equivalent of a full-length, comprehensive flora, with detailed descriptions; for Victoria, with its wide diversity of climate and soil-types, such a project would be both extremely bulky and almost prohibitively expensive for the student.

This second edition fully updates and corrects the original text by the addition of a supplement and index to supplement.

The long-awaited companion volume, Dicotyledons, has now been published, but each volume is self-contained with its own keys and index.

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